NATIONAL PETROLEUM NEWS

VOL. XV CLEVELAND, OHIO, October 17, 1923 NO. 42

Pacific Coast Oil Competition With Mid-Continent Re-established

By Paul Wagner
STAFF REPRESENTATIVE

LOS ANGELES, Oct. 13

WHATEVER advantage accrued to the Prairie Oil & Gas Co. through its recent readjustment of gravity schedules was wiped out, so far as Atlantic Seabord competition is concerned, when the Standard Oil Co. (California) published its Oct. 9 reduction in the contract price governing Los Angeles basin crude at the wells.

Although the Standard's new prices represented reductions ranging from 2 cents a barrel for 22 gravitly to 28 cents a barrel for 35 gravity and above, the significant grade affected was 28 to 28.9 gravity, within the range of which is included the average pipeline stream of the Los Angeles basin fields. This grade was reduced 14 cents, from 83 cents a barrel to 69 cents.

Plus 22 cents pipeline and loading charges, southern California light crude is brought to a 91-cent level, f. o. b. tanker. Lower freight rates now prevail than formerly, revised figures showing a transportation cost through the Panama Canal to points north of Cape Hatteras of 75 cents a barrel for crude. After adding .005 cents marine insurance, the laid-down cost totals $1.665, including tolls.

Treating 33 gravity Mid-Continent crude as the approximate pipeline stream, its laid-down cost at Atlantic seaboard destinations totals $1.9675, made up as follows: Crude at the wells, 90 cents; average pipeline tariff, 76¾ cents; gathering, 20 cents; Prairie Oil & Gas Co. brokerage, assumed to be 10 cents.

The estimated gasoline recoveries from the two general grades of crudes fairly well balance, with perhaps a slightly higher percentage shown for the raw material from the Los Angeles basin. The lower gravity of the so-called light crude of southern California does not mitigate against it in refinery practice because of varying characteristics which cause the Mid-Continent grade mentioned to be relatively low in light ends.

The influence of Santa Fe Springs crude is mainly responsible for the present average of the Los Angeles basin stream, which has increased from 26-27 gravity last spring to 28.3 gravity at this time. In this connection, it will be of interest to refer to refinery analyses of the various crudes from Long Beach, Santa Fe Springs and Huntington Beach, which were made public in a paper of Roy E. Collom, in his recent capacity as oil and gas supervisor of the California State Mining Bureau, at the mid-year meeting of the American Association of Petroleum Geologists. These analyses, in which the crudes from the different producing zones are separated, appear in an accompanying table.

LONG BEACH CRUDE

Depth—3300 feet
Gravity at 60 F.—26.3 Be.
W. & B. S.—1.0%

Gasoline at 60 Be	15.5%
or	
Navy Special Gasoline at 54.2 Be	21.8%

Fractionation

Tops	52 Be.	—27. 8%
Slop Distillate	37 "	— 1.2 %
Cracking Distillate	33 "	16.17%
Furnace Distillate	25 "	—11.43%
Residuum	9 "	—43.4 %
		100.00%

SANTA FE SPRINGS CRUDE

Bell Zone

Depth 3800 feet
Gravity at 60 F.—31.5 Be.
W. & B. S.—0.4%

Gasoline at 60 deg. Be	17%
or	
Navy Special gasoline at 55.2 deg. Be	25.3%

Fractionation

Tops	52 Be.	—32.5 %
Slop Distillate	37 "	— 6.0 %
Cracking Distillate	33 "	—20.1 %
Furnace Distillate	25 "	— 0.8 %
Residuum	16.3 "	—40.8 %
		100.00%

Meyer Zone

Depth—4500 feet
Gravity at 60 F.—34.7 Be.
W. & B. S.—0.3%

Gasoline at 60 deg. Be	30.2%
or	
New Navy Gasoline	37.0%

Fractionation

Tops	51 Be.	—51.5 %
Slop Distillate	37 "	— 0.0 %
Cracking Distillate	33 "	—12.5 %
Residuum		—36.0 %
		100.00%

HUNTINGTON BEACH CRUDE

Bolsa Zone

Depth—2900 feet
Gravity at 60 F.—25.0 Be.

Fractionation

Gasoline	56.0 Be.	—16.09%
Engine distillate	40.5 "	—10.1 %
Kerosene	38.5 "	— 2.35%
Still bottoms	32.0 "	— 4.99%
Asphalt Residuum	15.3 "	—63.79%
B. S. & M.		— 2.68%
		100.00%

Ashton Zone

Gravity at 60 F.—25.5 Be.

Fractionation

Gasoline	53.2 Be.	—17.92%
Engine distillate		— 7.68%
Kerosene		— 4.73%
Still bottoms		— 1. 4%
Asphalt Residuum		—66.5 %
B. S. & M.		— 1.77%
		100.00%

In some instances, crude of 29 plus gravity is moving on Atlantic seaboard contracts, but it will be apparent from a reference to the new Standard price schedules in California that this grade of raw material would reach eastern destinations at only 1 cent higher than that which conforms more closely to the Los Angeles basin stream.

Figured roughly at a 23 per cent recovery of Navy special gasoline in straight-run refinery practice, it is apparent that a still further competitive point is found in favor of this material in comparison with a 33 gravity stream from the Mid-Continent, which latter ordinarily is considered to refine not more than 20 per cent motor fuel.

Although the gravities of crudes given are not susceptible to direct comparison, the accompanving table prepared by Walter Miller, director in charge of refining of the Marland Oil Co. is republished from the July issue of Mar-

Tonkawa

Product	Per Cent	Gals.
New Navy Gasoline 42-44 Be.	46	19.32
41—42° Baume Kerosene	8	3.36
32—34° Baume Gas Oil	27	11.34
24—28° Baume Fuel Oil	5	2.10
Lubricating Oil	5	2.10
Wax	1	.42
Coke	3	1.26
Loss	5	2.10

Burbank
36-38 Be.

Product	Per Cent	Gals.
New Navy Gasoline	30	12.60
41—42° Baume Kerosene	18	7.56
32—34° Baume Gas Oil	28	11.76
24—28° Baume Fuel Oil	7	2.94
Lubricating Oil	8	3.36
Wax	1	.42
Coke	4	1.68
Loss	4	1.68

Mid Continent
34-36 Be.

Product	Per Cent	Gals.
New Navy Gasoline	27	11.34
41—42° Baume Kerosene	19	7.98
30—34° Baume Gas Oil	28	11.76
24—28° Fuel Oil	8	3.36
Lubricating Oil	8	3.36
Wax	1	.42
Coke	5	2.10
Loss	4	1.68

(Continued on next page)

California 25-26 Be. Product	Per Cent	Gals.
New Navy Gasoline	20	8.40
41—42° Baume Kerosene	4	1.68
35—37° Baume Gas Oil	17.5	7.35
16° Baume Fuel Oil (Bottoms)	57	23.94
Loss	1.5	.63

1—Exclusive of cracking.
2—California crude is not run to coke.

land Oils as an index to approximate yields, both on specific and general grades.

Attenion should be called to the fact that 54 gravity gasoline from the Pacific coast is recognized as a competitive grade on the Atlantic seaboard, as it meets new Navy specifications. With the exception of gasoline movements to Europe, tanker loadings on the Pacific coast consist mainly of crude to destinations whether other domestic refining territories would ordinarily compete. Shipments to the Orient and the West Coast of South America ordinarily move out of Pacific coast refinery centers.

It has been found interesting, however, to show the cost of gasoline transportation (in water white boats) to the various intercoastal and foreign destinations. These figures, based on a price of 8.5 cents a gallon at the California plant which is considered a fair approximation of the refinery price, show up as follows:

GASOLINE

To Atlantic Seaboard

Cost, 42 gallons at 8.5c	$3.57
Freight	.85
Insurance, $4.90 at ¼%	.01225
	$4.43225

($4.43225 divided by 42 equals 10.553 cents gallon.)

To Gulf Coastal Ports

Cost	$3.57
Freight	.70
Insurance, $4.70 at ¼%	.0117
	$4.387

($4.387 divided by 42 equals $10.445 cents)

To Japan

Cost	$3.57
Freight	1.00
Insurance, $5.04 at ⅓%	.0168
	$4.738

($4.738 divided by 42 equals 11.27 cents gallon)

To United Kingdom

Cost per gallon	.085
Freight	.02579
Marine insurance, 12c at ½%	.0006
	.1139 cents gallon

Crude Oil Freights

Crude oil rates to destinations other than Atlantic seaboard points north of Cape Hatteras are as follows:

To Gulf Coastal Ports

Pipeline and crude	.91
Freight	.60
Marine Insurance, $2 at ¼%	.005
	$1.515

To Japan

Pipeline and crude	.91
Freight	.90
Marine Insurance, $2.18 at ⅓%	.0072
	$1.8172

United Kingdom and Continent (France, Germany, Etc.)

Pipeline and crude	.91
Freight	1.2634
Marine Insurance, $2.60 at ½%	.013
	$2.1864

Comparative Prices

Comparative crude oil prices at the well in Los Angeles basin as between the schedule prevailing from April 10, last, to October 9, and thereafter, are shown in the following table:

Gravity—	Old schedule, posted April 10	New schedule posted Oct. 9
14 to 19.9	$ .60	$ .60
20 to 20.9	.61	.61
21 to 21.9	.62	.62
22 to 22.9	.65	.63
23 to 23.9	.68	.64
24 to 24.9	.71	.65
25 to 25.9	.74	.66
26 to 26.9	.77	.67
27 to 27.9	.80	.68
28 to 28.9	.83	.69
29 to 29.9	.86	.70
30 to 30.9	.89	.71
31 to 31.9	.92	.72
32 to 32.9	.95	.73
33 to 33.9	.98	.74
34 to 34.9	1.01	.75
35 and above	1.04	.76

Teapot Inquiry Is Delayed, Committee Fails To Appear

By Special Correspondent

WASHINGTON, Oct. 15.—In Theory a sub-committee of five of the Senate committee on public lands and surveys today began an inquiry into the leasing of the Teapot Dome to the Mammoth Oil Co. in accordance with a call of the committee issued in June when it was decided it was too late in the session to begin its inquiry.

As a matter of fact, only three members of the committee showed up, the same being Smoot, Walsh and Jones. Lenroot and Ladd wired that they could not be here, the latter until Oct. 17 and the former until Oct. 19. The three who met therefore decided to postpone the beginning of the inquiry until Oct. 22, when, according to promises, the five will be present.

Senator Smoot, as chairman, has received the reports of Frederick G. Clapp and James O. Lewis, the geologists selected by the committee to examine the geological structure of the oil bearing lands in that part of Wyoming and report whether there was reason for believing that Teapot could be drained from adjoining lands. The senator said today that he had not and would not read the reports but would have them read the minute the committee gets its inquiry started. He said he would not read them because he wanted to keep his mind open so as to receive all the testimony without any preconceived notions that might result from a reading of the report. The Utah senator had no idea as to how long the inquiry would last. There was a suggestion that it might not be an open hearing but Smoot said nothing other than a public hearing has ever been thought of.

Partisan political considerations and rabid conservation fears brought about the inquiry. Senator Smoot of Utah was influenced by neither politics nor any form of idyllic conservation. He was in real doubt as to whether there was the possibility of drainage from Teapot Dome such as had taken place from the naval reserves in California, which, if duplicated in Teapot would have constituted a real national scandal in the eyes of those who know about the enormous losses to the government by reason of Josephus Daniel's policy respecting the California reserves.

There was really only one palpable issue of fact for the committee to pass upon. That was as to whether the geologic structure of Teapot Dome and the non-government lands surrounding it was such as to make a reasonable man believe the oil in the reserve could be drained from it by wells on lands outside of the reserve.

Secretary Fall's technical men in the Bureau of Mines had advised him there would be such drainage. Therefore he and Secretary Denby made the contract for the development of Teapot. Thereby they created one of the greatest uproars the country has ever known. Fall has been placed at the head of the list of arch-fiends and traitors by the rabid natural-resources conservators, and by the arch-priests of holiness such as William Randolph Hearst, Robert M. LaFollette and lesser lights of that ilk.

Attorneys General Start Inquiry

CHICAGO, Oct. 15.— More than half the states of the union were represented by attorney general or deputy in Chicago today when their consolidated investigation of the oil industry began.

At the call of attorney general O. S. Spillman of Nebraska, legal representatives of all interested states left their offices or sent assistants to take part in a meeting which marks the start of the probe. The meeting is in the Old Colony club in the LaSalle Hotel and is expected to last three days after which the inquiry proceeds in a manner to be decided before adjournment.

The United States Department of Justice as well as Massachusetts and Nebraska have two representatives each who, with Gilbert E. Roe attending by request, aggregate 30 attorneys with 25 states represented. The meeting opened officially at 2 o'clock Monday afternoon and the first session was consumed by an address from Mr. Roe. Mr. Spillman presided and George M. Napire of Georgia acted as secretary. Mr. Roe, who is now helping Commissioner Nordman of the Wisconsin department of markets probe prices came over from Madison.

The current investigation was conceived in Minneapolis this summer when the National Association of Attorneys General held its annual convention.

It was there decided that the attorneys general should combine their efforts and permit all interested states to contribute of their staffs, appropriations and evidence. Attorney General Spillman was chosen to conduct the quiz in the name of the association.

Elementary instruction in petroleum started after dinner Monday night when a representative of the United States Bureau of Mines presented a three reel movie which Sinclair interests helped the government to make, entitled, "World's Struggle For Petroleum." It is rumored L. V. Nicholas, president of National Petroleum Marketers Association has been summoned to appear before the attorneys Tuesday to present Independents story.

THIS WEEK'S OIL NEWS SUMMARIZED

Marketing

(Marketing News, pp. 129-139)

GROWING popularity of high test gasoline by winter motorists is reflected in the large demand for premium grade motor fuel. Markets for high gravity goods in every refining center of the country are firm. The demand has come almost entirely from domestic sources as the export market has been quiet. Stocks have been reduced to a low point.

Navy gasoline has been holding its own in the southwest. Good weather has permitted of extensive motoring. The consequent demand for gasoline together with the slackened operations throughout the Mid-Continent, has eliminated most of the distress motor fuel. The existing stocks are in the hands of only five or six strong holders. The price of Navy has therefore been maintained at 6½ cents a gallon or higher, whereas, a month ago it was possible to get some of this grade at 6 cents.

Kerosene and distillates that may be burned in domestic heating plants, continue to be active and strong. Prices in Oklahoma have not advanced greatly since the demand for these oils became heavy, but east of the Mississippi values have increased around 2 cents a gallon for kerosene, and one cent for distillates. Fuel oil shows signs of rallying from the reaction that developed after the crude oil price reduction by Prairie last month.

Lubricating oils are firm with the exception of a few scattered spots. Pennsylvania steam refined stocks continue to be active and scarce. Demand for zero test oils has increased with the approach of winter and prices in the south Texas market are firmly maintained.

Domestic demand for paraffin wax has been heavy and Pennsylvania and Oklahoma refiners have advanced their prices.

Financial

(Financial News, pp. 140-142)

REDUCTION in the price of California crude oil hit the oil stocks on the New York Exchange a hard blow last week, wiping out most of the gains made the week before when reports that the peak of California production was past, had a buoyant influence.

Wall street was under the impression that another reduction would have to be made in Mid-Continent crude prices and this belief was accentuated by reductions in the posted price of light Texas crudes by Humble, and The Texas Co.

Sinclair was the object of bearish attacks in the middle of the week when it was rumored that the common stock dividend might be reduced. Maintenance of the $2 annual rate on the common caught the shorts and the resultant buying carried the stock above 19. Its close at 19 was a ⅛ point gain over the week.

Pan-American shares were depressed by the abandonment of a Mexican well by the Standard of New Jersey which was thought might have extended the "Golden Lane" to the westward. The well was drilled 5000 feet, said to be the deepest ever reached in Mexico.

Royal Dutch was firm throughout the week but its controlled company, Shell-Union, was weakened by the decision to issue the remaining 2,000,000 authorized shares of common stock at $10 or a third below the then market value.

Vacuum was the only active member of the Standard Oil group on the Curb market that was firm. Standard of Indiana lost 2⅛ points over the week; Standard of Kentucky 1½, and Standard of New York 1⅜.

Receivership Is Sought For Indiahoma

ST. LOUIS, Oct. 12.—Trustees of the estate of Gustav Wamsganz have filed a petition in federal court here asking for the appointment of ancillary receiver to take charge of the local assets of the Indiahoma Refining Co. The estate owns $3,750 par of the $5,000,000 outstanding capital stock of the company. It is charged in the petition that affairs of the company have been mismanaged.

* * *

MUSKOGEE, Oct. 16.—Application for a receivership for the Indiahoma Refining Co. in Oklahoma was filed Oct. 12 in the United States district court here by Hugh D. McCorkle and Irwin J. Hesley of St. Louis, trustees of the estate of Gustav Wamsganz.

The petitioners allege various acts on the part of the directors, including concealment of losses of the corporation and failure to issue financial statements. Preliminary hearing on the application will be had at Tulsa before Judge R. L. Williams, Oct. 18.

* * *

TULSA, Oct. 16.—Foreclosure proceedings against properties of the Constantin Refining Co. brought by the Spitzer Rorick Trust & Savings bank, Cleveland, Okla., are being heard here by U. S. Judge R. L. Williams of Muskogee. The bank seeks foreclosure of mortgage given in 1921 to secure bonds totaling $3,500,000. Receivers Pat Malloy and W. O. Dickerson, unsecured creditors and Constantin interests are opposing foreclosure.

Floods Threaten Plants

TULSA, Oct. 16.—More than 7½ inches of rain has fallen in Oklahoma since Friday slowing field work and transportation. High waters are disturbing some plants but no shutdowns have been forced.

CHICAGO, Oct. 16.—Standard Oil Co. of Indiana Oct. 15 met the 1-cent gasoline tank wagon reduction of competitors at Kansas City. Tank wagon price is 11.9 cents a gallon including city tax of 1 cent.

Production

(Production News, pp. 65-80)

ANNOUNCEMENTS by the Humble, Texas Co. and Magnolia last week that they would run 100 per cent of the oil in North and North Central Texas brought to the Mid-Continent and Southwestern operators a feeling that perhaps the gloom was beginning to break.

Immediately thereafter, the Powell field jumped to 190,000 barrels and the first of this week went on up to 250,000 barrels a day. This has, for the time, put the situation back about where it was and further price reductions in the Mid-Continent, bringing the market down at least to conform to the prices paid by the three companies named in Texas, would not astound anyone.

President Davis, of the Mid-Continent Oil & Gas Association, issued a statement at the close of last week warning producers against an assumption that because there has probably been a decline in the potential production in California, the troubles are practically dispersed. He characterized the industry as being very "sick" and in danger of getting much worse if drilling in the fields generally is resumed.

As for California, conclusions drawn by Paul Wagner, of **National Petroleum News** staff, who has just returned from there, may be summed up as follows:

The California production will continue to be a factor in the general petroleum industry so long as oil with a gasoline content of 20 per cent or more is produced in large quantity on the Pacific Coast. Crude of lower gasoline recovery probably will not justify the expense of transporting it to Eastern refineries unless an extreme shortage of high gravity crude is experienced in territories east of the Rocky Mountains.

Investments in equipment that California operators have made will cause some percentage of protective measures to be taken in pushing ahead development of new fields when those now active show a decline, notwithstanding that the general disposition will be to conserve California sources for Pacific Coast requirements at such time as the bulk of the crude produced reverts more nearly to the few companies normally in control.

Whenever an actual shortage can be forseen, however, and up to the extent of existing storage programs, the long-headed California companies can be expected to stock crude oil coming above ground rather that to produce and ship it because then they can see ahead the time when they can market at greater profit than by shipping raw material to Eastern refinery centers.

NEW YORK, Oct. 16.—Standard Oil Co. of New Jersey advanced export prices of kerosene ½ cent a gallon Oct. 15. This brings the bulk price to 6 cents; barrels 13, and cases 15.9 cents a gallon at Bayonne.

Jobbers Promised Rare Entertainment And Lively Sales Program

Staff Special

CHICAGO, Oct. 11

SUCCESSFUL sale of exhibit space in Milwaukee Convention Hall for the annual fall convention of National Petroleum Marketers' Association has assured one of the most elaborate displays of equipment ever shown at a jobbers' meeting. Only five or six of the 68 booths remained unsold at the last report from Secretary James A. Gilmore who has been in charge of exhibit arrangements. Through a system worked out by the Wisconsin jobbers, business done on the floor will be stimulated for the exhibitors, and at the same time help the association in this, and all future conventions. It is the prize ticket system.

This business booster never has been tried at a convention before and promises some excitement on the last day when the prizes are awarded. Each registered exhibitor will be permitted to pass out tickets on a basis of goods sold. The tickets are numbered and certain lucky numbers call for prizes. These prizes furthermore are numerous and valuable. The Heil Co. of Milwaukee, for instance, gives a truck tank as a prize. It will be built to the order of the jobber who wins it and may range between 300 and 1,000 gallons.

All Pulling Hard

Of course the Wisconsin jobbers are pulling together, they have a reputation for doing that which is one of the hardest problems big competitors have to deal with. But it will be seen that the accessory and equipment men of Wisconsin are getting behind the convention with pep enough to make it a success. The Milwaukee Association of Commerce also is taking part in the campaign, sending out advertising and doing more than ordinarily is expected from the "C of C" in a convention town.

J. M. McLaughlin, general manager of the O'Neil Oil & Paint Co., is chairman of the entertainment committee of the Wisconsin jobbers, who are hosts of the occasion. He is getting ready an entertainment which will be staged on the first night of the three-day convention (Oct. 23) as no party ever arranged before for an assembly of oil men. He recommends it as an entertainment to which any delegate may take his wife and both have fun. He has the oil men of Milwaukee, their families and office forces busy with the big show. It is heralded a Mardi Gras and will include refreshments and dancing.

The Milwaukee Tank Works is responsible for the offer of free lunch every day for every registered oil man. At many previous conventions this item has been covered in the cost of registration, but the fee in Milwaukee is $1.50 which is about enough to pay the clerical help around the headquarters and registration booth.

Transportation to Meet

The customary round trip for a fare and a half to the convention is in effect. In buying a ticket to Milwaukee, tell the agent you are attending the National Petroleum Marketers Association convention and want to take advantage of the reduced rates. He will take the full price for the ticket to Milwaukee but will supply each passenger with a slip of paper which when properly validated at Milwaukee, pays for half the return transportation.

In case any of the oil men have business in Chicago, the two cities are connected by an electric railway system which is in a class by itself. From Chicago elevated railway stations, trains leave for Milwaukee every hour. If it is meal time, they will have dining car service. The same is true coming back. Steam trains, although not so numerous give service just as good or better.

Nicholas For Reelection

CHICAGO, Oct. 12.—L. V. Nicholas, active president of the National Petroleum Marketers Association has announced his candidacy for re-election. He has sent printed ballots to every active member of the association to be checked and voted by mail. In accordance with the precedent of the N. P. M. A. and the two organizations from which it was formed, the name of every director was included on the ballot. It is assumed that the directorate embraces all likely and eligible candidates for the office.

The balloot carried also the names of the ten retiring directors as candidates for re-election, and blank lines for the names of any number of new directors, up to ten. The ballot also carried a proxy directing Mr. Nicholas to vote it as marked.

A Business Meeting

In a recent copy of the "Trade Bulletin" issued from the office of National Petroleum Marketers' Association, the spirit of the Milwaukee convention was described as one for promoting sound economic business. A few facts procured from unrelated statistical reports are compared in a little sermon on business conditions, indicating to the oil jobber that he must be prepared to collect a reasonable profit on goods sold at a sound price. In part the statement says:

"Only two million incomes in this country exceed $2500 a year. This means that more than nine of the 12 million automobiles in operation are owned by persons who must watch costs. Can we as an industry, hope to conduct our business successfully if we overlook the importance of getting our products to the consumer as cheaply as possible?"

Watching overhead expenses: Cutting down costs of operation: Getting more gallonage with less investment, and watching the signs of the times in the industry will be stressed at the meeting.

Tuesday Economy Day

Open forum discussions each will be led by different individuals. This year there is a long list of seasonable and interesting topics for discussion. These will be taken up, one or two at a time, by some oil man who is especially interested in his subject. He will state his own convictions, in a talk of 10 or 15 minutes, answer questions and draw opinions from other members. In this way every one will have a chance to hear every side of the question before he votes on any action proposed.

B. M. Marcus, president of Metro Stations Inc., Olean, N. Y., is scheduled to take up the general question of "Economy." His address will embrace economical construction, economical operation and reduction of expenses.

S. S. Cramer, president of the Wadhams Oil Co., Milwaukee, Wis., a member of the board of directors of the N. P. M. A., is selecting some man in his own organization to tell how the Wadhams Co. gets more gallonage with fewer stations, and his talk will embrace the cost of building stations, and the economy of investment.

These two discussions will occupy most of the first day of the meeting, along with registration and getting ready for the mardi gras in the evening. The first day of the meeting might rightly be called "Economy Day" as it will be devoted to the business of keeping down expenses in the jobbing business

Advertising—Oct. 24

The second day of the meeting will be given over to the important matter of developing business. Six talks are scheduled, which will keep the organization busy most of the day. Advertising, merchandising, and selling methods will be included.

A. W. Long, president of the Long Oil Co., Manhattan, Kan., starts the ball rolling with a talk on the "Possibilities of Advertising." A paper is being prepared by J. M. McLaughlin of O'Neil Oil & Paint Co, Milwaukee, on "Outdoor Advertising." That organization has made a success of advertising oil on billboards, and a number of other oil jobbers over the country have done the same. This it is expected will precipitate an interesting discussion. "Newspaper and Periodical Advertising" will be discussed by W. B. Phillips of Wadhams Oil Co.

C. H. Armould, Armould's Oil Co., Hamilton, Ill., will relate his experience with "Direct Mail Advertising" which he has been using for some time with good results. Fortunately in every case the heads of companies will be able to have their advertising men with them.

If anybody in the assembly wants the intimate details of some aspect of the subject, he can get them without waiting or without leaving town. "Selling—Constructive and Destructive" is the

subject assigned to J. L. Murray, president of the Corn Belt Oil Co., Bloomington, Ill., who recently surprised three or four state jobbers' meeting by telling his contemporaries how he sold his customers on doubling their consumption of automobile oils.

Exchange of Coupons

A. H. Caward, head of the Hawkeye Oil Co., Waterloo, Ia., will bring up the "Coupon Interchange" question. This is a matter upon which there has been a great deal of discussion but not very much done. Coupons have been exchanged between some independent jobbers. In fact there are some oil men who make public declaration that they will accept at full face value any gallonage coupon of any other Independent jobber. Along certain highways, in certain neighborhoods, and among acquainted oil men there has been a great deal of coupon exchange, but the practice has never become general or adapted to any particular system.

The third day's activities will be on the order of the round-table discussions of previous meetings. How the production and consumption of crude oil reflects upon the jobbers' business will be taken up. World conditions in the oil industry will be considered in view of their bearing on today's markets.

The problem of the Independent jobber, in view of the increasing number of oil companies entering all branches of the industry, is another topic for the third day. There is a growing tendency on the part of refiners to own their own distributing units, and also to enter into the producing branch of the oil business. These tendencies it is maintained, call for a definite policy on the part of jobbers.

The last, but by no means the least interesting matter, is that of "Marginal Contracts." Probably L. L. Coryell, of Corvell & Son, Lincoln, Neb., will be heard first on the subject. He has worked out a form of contract which has served him and his refiner both in a satisfactory manner.

Standard Gets Exclusive Rights To Ethyl Lead Compound

CHICAGO, Oct. 15

CHICAGO, Oct. 15.—Standard Oil Co. of Indiana has procurred the exclusive right to market "Ethyl Fluid" in its territory, over a stipulated number of years, and will start at once to equip its service stations with the necessary facilities. Ethyl fluid is a chemical product evolved by the General Motors Corp., after years of scientific experiment, and developed commercially by the same interests. It is an ingredient with which gasoline is treated to overcome the knock in an automobile engine. Standard's gasoline thus treated will be marketed as Ethyl Red Crown at a premium of 3 cents a gallon.

The first news of Standard's adoption of tetra-ethyl-lead (Ethyl fluid for short) came through an announcement by C. F. Kettering, president of the General Motors Chemical Co., in an address Friday night before the Mid-West section of the Society of Automotive Engineers. The meeting was in the S. A. E. club rooms in the Monadnock building. Robert E. Wilson of Whiting, Ind., member of Standard's technical staff was present also, but made no remarks on the subject. Standard officials confirmed Mr. Kettering's announcement the next day.

The product will be handled at Standard Oil Co. pumps just as it has been dispensed at service stations in Dayton and Cincinnati for several months. It is not represented to increase the power of a motor nor to get more miles out of a given number of gallons of gasoline, but to remove what is commonly referred to as the carbon knock, particularly noticeable on a hill.

Installation of equipment to treat Red Crown gasoline with Ethyl fluid will begin at Standard's more eastern and southern marketing districts. In southern Indiana, it is stated, some Standard's distributing units will be able to supply their trade with Ethyl Red Crown in a few weeks. Working north and west from Ohio river points during the winter it is believed that all of the company's 1851 service stations will have it on sale by the height of the 1924 motoring season. Standard officials state the experiment will begin in hilly towns where the demand for an anti-knock fuel is greater.

The price paid by Standard Oil Co. of Indiana to the General Motor Corp., for the exclusive rights on the latter's discovery, has not been made public, nor has the exact length of time for the arrangement to run been announced. It is stated at Standard Oil executive offices that the experiment will be long enough to constitute a complete test of the merits of the proposition, and it is assumed that the rights cover a period of five or six years.

Gasoline treated with the new product is charged at the time it is being pumped from the service station storage to the tank on the customer's automobile. A small container filled with Ethyl fluid is attached to the pump.

New Process For Making Lubricants

TULSA, October 11.—A new motor oil with a "low interfacial tension" is soon to be placed on the market through jobbers exclusively by the Missouri Valley Refining Co. a newly organized compounding and grease manufacturing company of Tulsa.

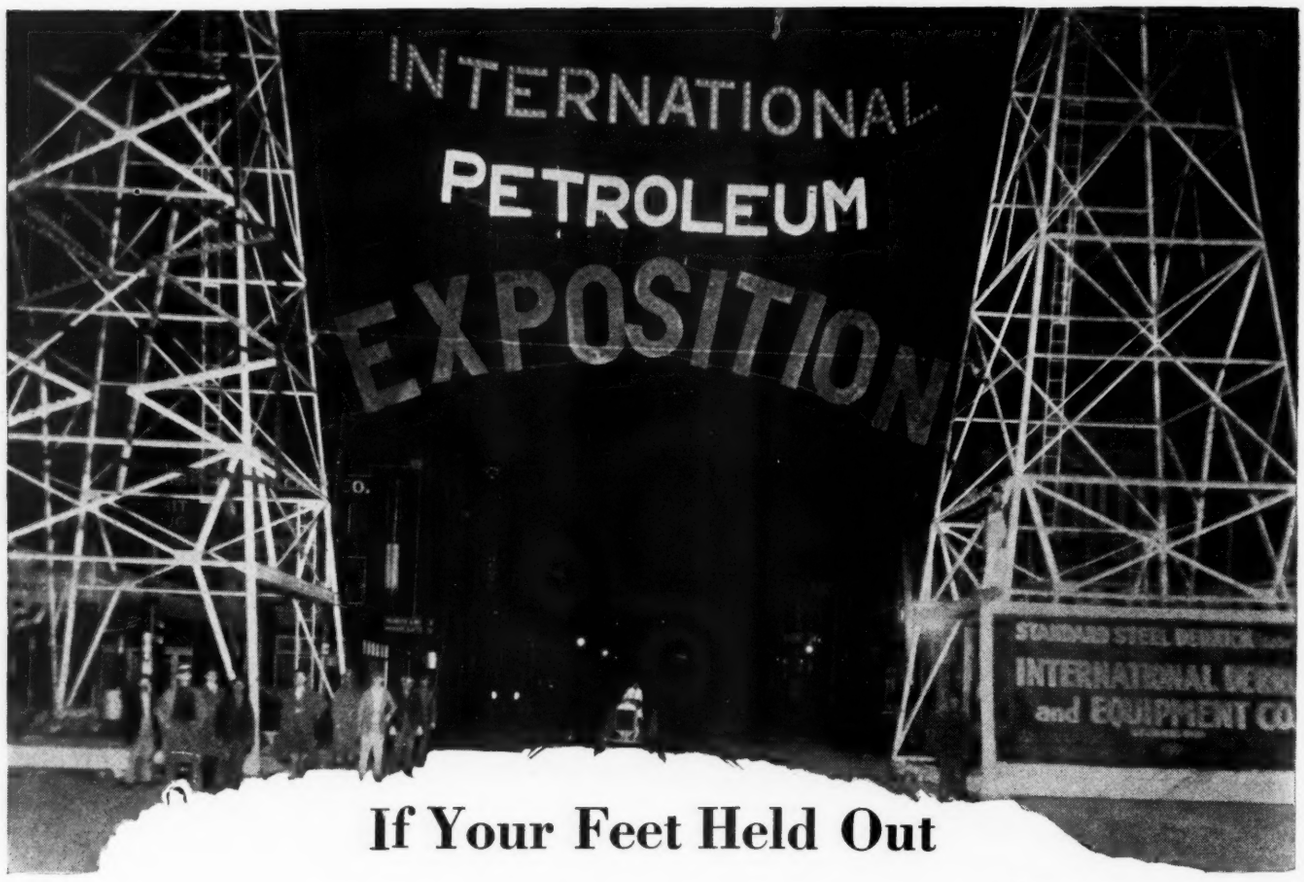
The description of the oil is that of its creator John Owens, for many years with the Standard of Indiana at Whiting and more recently with the Standardized Lubricants Co. of Tulsa. By that description Mr. Owens says he means that the oil will hold in a film over the bearing better than an ordinary oil. He says its a pure mineral product, has no animal, vegetable or fish oil in it and that its manufacture is a new idea on which he has applied for patent. The oil will be offered the jobber about November 1 when it is expected the new plant now under construction at Joe Station, near Sand Springs, will be running.

Mr. Owens is vice president of the new company and J. T. Bradley president.

Exhibitors At The N. P. M. A. Convention

Milwaukee, October 23, 24, and 25

Firm	Booth
American Can Co., Chicago, Ill	3
Au-to Compressor Co., Wilmington, O	30
Bennett Injector Co., Muskegon, Mich	8
Brunner Manufacturing Co., Utica, N. Y	32
Bowser, S. F., & Co., Fort Wayne, Ind	57
Chicago Tubing & Braiding Co., Chicago, Ill	53
Curtis Pneumatic Machinery Co., St. Louis, Mo	70
Davis Welding Co., Cincinnati, O	64 and 65
Dawes Electric Sign & Manufacturing Co., Pittsburgh, Pa	49
Dayton Pump & Manufacturing Co., Dayton, O	28
Fleckenstein Visible Gasometer Co., Grand Rapids, Mich	43
Findlay Visible Pump Co., Findlay, O	34
Gilbert & Barker Manufacturing Co., Springfield, Mass	31
Graham Brothers Truck Co., Detroit, Mich	54 and 55
Graver Corp., East Chicago, Ind	6
Guarantee Liquid Measure Co., Rochester, Pa	4
Heil Co., The, Milwaukee, Wis	63
Kellogg Manufacturing Co., Rochester, N. Y	35
Kraft Co., A. C., Chicago, Ill	10
Lindsay-McMillan Co., Milwaukee, Wis	18
Loew, Clifford A., Milwaukee, Wis., (signs)	19
Marvel Equipment Co., Cleveland, O	11
McSaveney Co., The, Springfield, O	17
Metal Hose & Tubing Co., Brooklyn, N. Y	66 and 68
Midland Specialties Co., Chicago, Ill	14
Miller Petroleum Co., Kansas City, Mo	62
Milwaukee Air Power Pump Co., Milwaukee, Wis	7
Milwaukee Tank Works, Milwaukee, Wis	40
Morrison Brothers, Dubuque, Ia	12 and 13
Mullins Body & Tank Co., Milwaukee, Wis	5
National Car Seal Co., Hamilton, O	58
National Enameling & Stamping Co., St. Louis, Mo	1
National Gasoline Hose Co., Brooklyn, N. Y	51
National Petroleum News, Cleveland, O	59
National Recording Pump Co., Dayton, O	38
Parker Motor Truck Co., Milwaukee, Wis	15
Pressed Steel Tank Co., Milwaukee, Wis	56
Rand McNally & Co., Chicago, Ill	37
Roy Manufacturing Co., Quincy, Mass	46
Shotwell Pump & Tank Co., Boston, Mass	29
Springfield Visible Pump Co., Springfield, Tenn	26
Sterling Motor Truck Co., Milwaukee, Wis	2
St. Louis Tin & Sheet Metal Working Co., St. Louis, Mo	36
United Metal Hose Co., New York City	27
U. S. Air Compressor Co., Cleveland, O	39
Wall Pump & Compressor Co., Quincy, Ill	33
Wayne Tank & Pump Co., Fort Wayne, Ind	60 and 61



If Your Feet Held Out

Equipment Display Was Feature Of Tulsa's Show

By Lawrence E. Smith
STAFF REPRESENTATIVE

TULSA, Oct. 13

TOUCHING upon this little matter of the International Petroleum Exposition, we were reminded of the cub reporter who passed three half-million dollar fires; two persons committing suicide and a gentleman successfully upholding his fistic prowess against three policemen. The cub was on his way to report a tennis match.

The application of this parallel is that the editor way off in Cleveland assigned us to what we thought was going to be the tennis match of the Tulsa exposition and we failed dismally in our efforts to see the Congress part of the show. King Petroleum entered the grounds twice and all we got of it was the distant strains of "Yes, We Have No etc., etc."

The king was joined by his royal consort and all we saw was the photograph in the morning paper. They have had a big parade or so uptown, but we didn't even hear the music from the bands. The lady snake charmer looked interesting from afar, but whether her snakes were real sidewinders or made of rubber we never did find out.

So it went for many, many, foot-sore days. We were assigned to spend our time at the exposition, among the displays and exhibits. We had little speech-making to report, except for occasional oratorical outbursts Bill Palmer of the National Supply Co. made in telling of the many virtues of his Tampico ground hog. Wherefore, as far as we're concerned, there was nothing going on except the exposition, meaning the lavish display of equipment, machinery, tools, fittings, proccesses and a lot of other articles which, as do the boys in the navy, we shall merely call "gadgets."

Note—The editor feels constrained to insert a paragraph here announcing that Mr. Smith made so much of his assignment or his assignment made so much of him. that what he thought was the tennis match turned out to be the big story of Tulsa's big week.—Editor

Give these supply men an inch fitting and they'll take a three-inch ell every time. Whisper it, as subdued as you please that some sort of occasion is to be provided whereby they may display their wares and, before you round out the sentence, their bills of lading for their exhibits have started to come in.

Their nimbleness, in fact, is approached only by the speed of Bert Swor, the old minstrel man. He said his electric light was twenty feet from his bed and he could turn it out and be half asleep before the room got dark. In Tulsa there was conceived the projects of conducting the exposition and between conception and labor, the response of the supply men was so fervent that all the estimates of Comrade McIntyre, the secretary, as to the amount of space that would be required were converted into a well cocked hat. Wherefore, a rush of the belated ones to overflow onto the grass plots and into whatever corners were available.

Not long ago an apostle of the good clothes cult spake unto the multitude and said the average American man is an exceedingly shabby individual underneath his outer layer. He said the common run of socks was full of holes and that the step-in garments were so shabby as to constitute one of our real national problems. One of the small Independent producers of the Mid-Continent said the exposition made him feel the same way about his leases; that he had never realized how far behind the times he is.

Probably no production man who saw the exposition failed to see something that would effect a considerable improvement over what he is now doing. Few of them but that wished he could have everything new that he saw. While the object first of all was to display equipment, there was no company so haughty and aloof as to turn down immediate business and we heard of a number of life-sized orders that were placed as the direct result of the show.

When the bugles were first sounded last summer calling attention to the exposition, the first reaction of the oil man was that a nice little show might be held, somewhat on the general scale of the Tulsa county fair. The bugling became a fanfare and attained a crescendo that was sustained for weeks.

Chief Bugler Reid McBeth tottered homeward wearily from his smoking typewriter night after feverish night and the cry went round in adjacent states and, even within the commonwealth of Oklahoma, that this was another fine example of western sound and fury signifying, in its last analysis, something with a minus sign before it.

There was historical basis for such opinion. Speaking as one who formerly

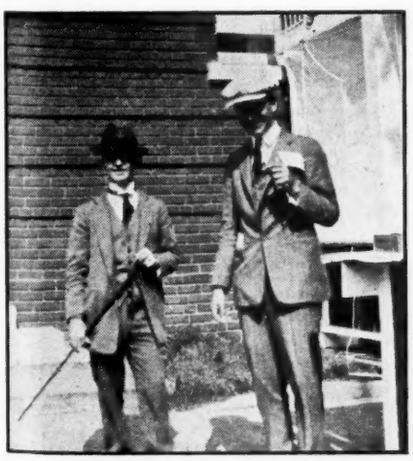
engaged in the business of fitting together the several parts of speech to fill up the columns of daily newspapers in Oklahoma, we can say that enthusiasm over any project at hand that seems to merit editorial support is the thing most easily turned on. Any good journeyman reporter in the state can lash himself into a state of mind bordering on the fanatical over the chamber of commerce proposal to widen Locust avenue; over the abolition of all flies and mosquitoes; over the mayor's suggestion that all hitching posts be removed from Main street.

Now the supply men were in the know all along, but there were hundreds who came from afar expecting to see a number of pretty little booths and hear several speeches all saying the same thing who were exceedingly amazed. The exposition burst upon them Monday morning wreaking the same effect that the lights of Broadway have on the man who sees it for the first time.

There have been many exhibitions of oil industry equipment before this. If our memory is correct—and we beg to be informed if this is in error—the previous largest ones have been the displays at the conventions of the Natural Gas Association of America. The Tulsa show, both for extent and completeness, far transcends anything that has ever happened.

Only the man who made the rounds comprehends its size. Statistics on floor space, value of equipment, expense of running the exposition are but the pale, flat kodak pictures of the painting of a master. But the man who started out briskly in the morning to see the attractions and limped in at night with his assignment one-tenth completed really knows how vast was the undertaking of the 200 companies participating and how perfect was their execution.

Withal it was a colorful show. Of course, nothing looks so well and seems so the acme of perfection out on the lease as it does when tastily arranged with colored cloth drapings, with plenty of lazy benches around so the visitor may rest while he scrutinizes. A pretty girl passing out souvenirs or decorating each visitor with a rose also adds considerable to the merits of the display. But the decorativeness was largely confined to the smaller equipment that could be displayed.



From left to right, Walking Stick, Ralph Kirkland and C. A. Border. Kirkland worked throughout the exposition to put over the Knights of the Derrick. Border is secretary of the Tulsa Chamber of Commerce

For the heavier goods it was action throughout. The Oil Well Supply Co., for instance, rigged up an Imperial rotary as did the American Well and Prospecting Co., of Corsicana, Tex., each with a shortened Kelly, and the whole equipment was put through its paces constantly. A number of companies supplied one complete cable tool outfit and contributed dry hole money for a well on the exposition grounds. After spudding cautiously for about three days, drilling started. The well was shot this evening with no result and will be carried on the maps as dry and abandoned.

That same southeast end of the exposition had a genuine oil field flavor. Several heavy oil engines were going and a number of sizeable gas engines. Add to this the seeming necessity for tooting whistles on the boilers, and the output of noise per square foot exceeded that in most any field you care to mention. The production in this respect was the greatest on record.

Convention Hall, around which the exposition ranged, is Tulsa's big gathering place. It has served many purposes since it was built. High-priced singers appear here from time to time and in it John the Barber formerly staged fistic attractions. It was the center of the exposition and all the displays were arranged in booths to the south, east and north. Nearly all the booths were of the portable steel type built by the Braden Co., which is a consolidation of the various interests of the late Glenn T. Braden. The exposition, therefore, for the greater part was indoors. A few frame booths were put up, but most of the housing was fireproof.

One thing that was greatly appreciated was the management's thoughtfulness in allowing plenty of aisle space between the rows of exhibits. A few feet less and some elegant traffic jams would have occured. As it was, the boys from the great open spaces, where a man has plenty of room to swing his arms, were not hampered in their free movements, which is just as the constitution provides.

Within the booths there was action, but of a more quiet character than out in the open where the heavy duty machinery was demonstrated in actual field operation. Under the roofs the power was electricity. In some cases it was a little misleading, for special equipment was devised to apply the power and a few of the company representatives developed latent oratorical powers in explaining that the extra machinery really didn't belong, that in field use, and so on and so on. But, to the production man, the story went over easily.

The question of making the exposition an annual affair is in the offing. Opinions have been expressed both for and against by the supply men. One said he thought the progress made during any year was too little—that equipment changes in design and quality so little in a twelve-month period—that it would be seining the same old pond over and over to hold the show each year.

To this view others have disagreed. One big manufacturer says the equipment end of the industry is right now in its greatest period of change and calls forth as evidence the progress being made in standardization, which has as its ultimate object not only interchangability of equipment, one manufacturers goods with another, but elimination of many unnecessary types and duplications. He further says the changes will be sufficiently rapid for several years that equipment men will be glad to show the public anually just what he has done and the production man will be tickled at the chance to see it all in a day or so.

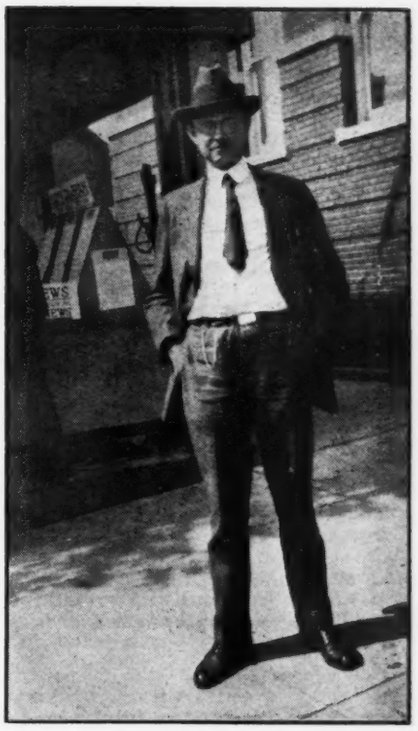
There seems to be merit in this latter contention. Look, for example at this year's exposition. Quite a few articles were introduced here before the makers have offered them to the public or have put on a sales campaign. There have

How N.P.N. Covered The Big Show

THE comprehensive stories on the Tulsa exposition you are reading in this issue are possible through the fact four members of its editorial staff devoted a week to studying the exposition and attending conferences and association meetings held in conjunction.

In addition to A. F. Hinton and J. C. Chatfield, of the Tulsa Editorial Bureau, L. E. Smith, production news writer from the Cleveland office and V. B. Guthrie, managing editor, devoted their time exclusively to writing the story.

Last but not least, Warren C. Platt, publisher, found time among other duties to get up some of the news himself.



Dr. E. N. Layfield, Hope Engineering & Supply Co. in a convention mood.

been changes in design in others that were forcefully demonstrated.

Cranking up our harker, now, and harking back to the original text, to-wit: the response of the supply men to the exposition idea. They made of the occasion a regular Old Home Week. It wasn't left to the district managers alone in each company to put the thing across, but the lords of high decision were on hand and down to a shirt-sleeve basis in meeting the trade. Action every minute. It cost a staggering amount of money in the aggregate to put in the equipment, keep it running and man the breastworks, but it was poured out without stint.

We may anticipate that the exposition did not end with the formal closing thereof. Out on the lease or driving over the rutty roads and through the mudholes to the wildcats to check up the rumored showings of oil and gas, your average oil producer is going to keep on thinking of what he saw at the show. Every little while he is going to see short cuts that can be taken in his business together with just the article he saw at the exposition that will turn the trick. Or the same may apply to other divisions of the industry.

Here, for example, is the refiner who is thinking in terms of more gasoline. There were demonstrated at the exposition on small scale, some of the processes that will do it. The tank men showed him and the producer as well how to cut down his evaporation losses. The pipe line man saw in operation several of the oil engines that will handle any job and most of the pumps. The latest in handling gas, gasoline, producing gasoline from gas, vending it to the consumer, all were shown in action.

It wasn't long before the production men who saw the opening of the show were intrigued with the idea and from then on the district superintendents were being called in to look over the gigantic exhibition. In this respect the exposition was held at a timely moment, for there is a notable lack of anything going on in most of the fields. The boys can spare the time better than they can when the market is good.

For these fellows the show had real meaning and deep significance. In all cases the exhibitors were courteous to the point of profuseness and the school marm from Skiatook got as much attention as anyone else when the exhibitors were explaining their several displays. We saw a refiner's representative patiently telling a woman all about the various grades of oils he was exhibiting and it was news to her that some of them were neutral oils and not violently partisan. But the man from the field required little comment on what he was looking at. He works with the equipment every day and any deviation from what he is accustomed to is detected just as quickly as the old clothes man sees the hole in the suit you are trying to get a good price for.

There are those old timers who love to make comparisons between the equipment they used when they started and that in vogue now. For these the illustrations were at hand. The Drake tools, owned by Lewis Emery, of Bradford, were on exhibition and close beside them the string that was used in drilling the first dry hole in West Virginia in 1844—considerably antedating the Drake well. This string is owned by P. V. Murphy, of Parkersburg. The only thing that hasn't been changed much to date is the jars and the principle of cable drilling. Then there was a horse-drawn rotary shown by the American Well and Prospecting Co.

To this correspondent one of the vital although a somewhat intangible point made by the equipment men during the exposition was the demonstration of service—future as well as present—they are prepared to give the oil man. No reason for further belief on the part of anyone that the supply dealer and manufacturer are not integral members of the oil and gas industry. For one thing, the presence of so many high powered engineers attached to the various companies is proof positive that the oil man need not worry that his needs will not be anticipated. When he requires a thing he will find that, if it is not already on the market, it very shortly will be. These men are touring the fields and the refineries constantly and any disadvantage that the oil man might be inclined to put up with will before long be ironed out.

And the average oil man is quick to give the credit where it belongs. It is not unlike the experience of the farmer of a few years ago. He walked from dawn to dark, gazing at the cruppers on a pair of hard tails, wearing callouses on his feet and ridges on his soul. Some manufacturer came along and showed him that his weight could be added to the load without great hardship on the mules and the idea went over.

The same is true of the oil producer. Not long ago a Pennsylvania operator remarked that little progress had been made since the days of the Drake well, yet on his lease we noted a late model gas separator, the newest style pulling machine, a fine compressor with which he was putting gas back into the sand and increasing thereby his recovery of oil and any number of things he didn't have when he started in the business. When this was pointed out he answered it by saying that it was the supply companies that had wrought the improvements and not the producers themselves!

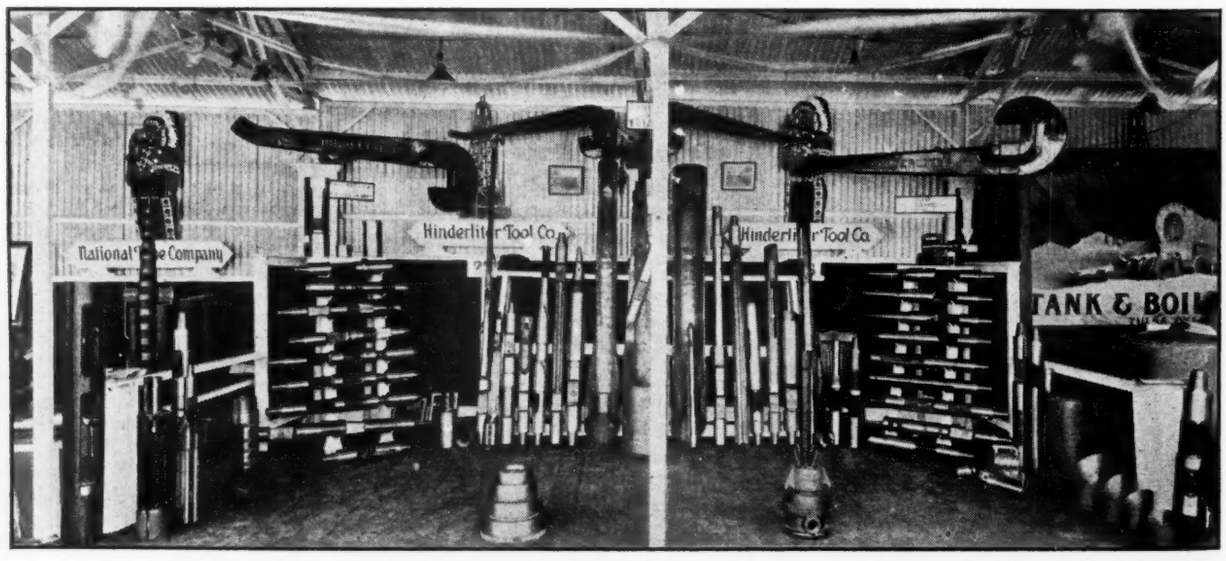
Withal, Tulsa is to be congratulated on the exposition and in particular the supply men who entered their choicest wares stand forth as thoroughgoing judges of values. This is the first of what should be an institutional affair that will bring the oil men from all over the world to keep step with the progress of the industry.

Putting It Simple

TULSA, Oct. 13.—M. George Anagnostache, who represented the Rumanian government and addressed the congress upon the oil situation there, in an aside to the audience explained the meaning of nationalization of mineral wealth in his country.

"We have this principle in application in Rumania," he said. "The surface belongs to the people. The humblest peasant, who works from morning to night, shares in the produce of the soil —in its pastures and fields.

"But the sub-soil wealth of the country belongs to the Dutch-Shell."



Hinderliter Tool Co.'s booth at the exposition.

Marland Warns Of State Legislation Regulating Production Methods

Staff Special

TULSA, Oct. 13

THE International Petroleum Exposition and Congress is to be made an annual affair it was voted by the congress at its closing session. The second will be held in Tulsa probably some time next fall. Resolutions endorsing that idea were presented to the congress by a committee composed of J. A. Hull, J. K. Crawford, W. G. Skelly, D. F. Connolly and J. H. Markham, Jr., all oil producers.

Activities of fake oil promoters in fleecing the public and bringing the entire industry into ill repute were scored in a resolution unanimously adopted by the congress. The resolutions were presented by a committee composed of J. A. Veasey, counsel for the Carter Oil Co., Clint Moore, producer, W. M. Welch, vice president of the Tidal Refining Co., E. W. Marland, president of the Marland companies and H. H. Smith, secretary of the Mid-Continent Oil & Gas Association.

Following are the resolutions as adopted:

"Whereas, it has come to the attention of the International Petroleum Congress that the legitimate oil industry of the United States has suffered public criticism and hostility on account of losses incurred by the public through investment in various oil producing and refining enterprises, and the public fails to distinguish between the legitimate, established oil industry and the fake promotion schemes carried on by novices and unscrupulous adventurers, which latter have occasioned most of the public losses.

"Now, therefore, be it resolved by this congress that we invite the public to investigate the character and standing of those concerns which make extravagent representations in order to sell oil securities, to the end that only deserving and experienced oil operators be given financial support.

"The oil industry is a legitimate and essential one, but has its parasites and hangers-on, known as fake promoters, who seek to mulct the public under the false representation that they are a part of the established industry.

"In order that both this industry and the public may be protected against these parasites, this congress resolves that, through its proper committees, it will co-operate with oil organizations in an endeavor to apprise the public of the true conditions to the end that the fake promoters may be exterminated."

The congress endorsed the organization of oil men known as the Knights of the Derrick which is being formed. A committee composed of D. E. Buchanan, vice president of the Chestnut & Smith Corp., A. W. Leonard, P. M. Miskell, vice president of the Empire Refineries, Inc., R. F. MacArthur, Barnsdall Corp., and W. N. Davis, president of the Mid-Continent Oil & Gas Association, presented this report.

State Legislation

Among the valuable points for consideration by the oil industry brought up in session of the general congress was that presented by E. W. Marland, head of the Marland Refining interests, to the effect that legislation in oil-producing states may be expected leading to prevention of waste of natural resources through over-production of crude.

Mr. Marland dismissed the subject of possible federal regulation of production as being unconstitutional, but pointed out that the U. S. Supreme Court has upheld state action in stopping wastage of natural gas and that similar steps might be expected as regards oil production.

"There is a distinction between the property rights of the land owner, or his lessee, and the ownership of oil and gas deposits that may be under a given tract of land at any time," he said. "He only possesses the right to capture and possess it."

Pointing out that the state wealth was greatly affected by the manner in which oil pools are drilled up, whether it be done with overproduction and consequent low prices, or in a manner to spread the life of the field over a considerable period; and that the state income from gross production taxes is directly affected by the price of crude, Mr. Marland stated he considered some form of state regulation of production of oil within the state is almost inevitable.

"The state itself will need that regulatory power to determine its income from taxation, to protect the value of the school lands of the state, and to save from sacrifice its limited reserves of oil, which are intended to aid in support of its school system.

"Land owners will favor such regulation to protect the value of their property.

Help All Interests

"Lessee owners will be in favor of it to protect their interests; and to protect their rights against the encroachment of neighboring operators who would seize and possess their oil, unless they themselves reduced it to possession, in times of overproduction and when it was wasteful to do so.

"No one in the oil business is more anxious than I am to avoid either federal or state regulation of business, but I am becoming convinced that we need some law in this state to enable us to protect our property—the oil under the ground—from the attempts of those operators who try to seize it and reduce it to possession by drilling wells on adjacent lands when economic conditions of supply and demand do not permit us to drill our wells and recover and market our oil at cost."

Mr. Marland suggested that the congress appoint a committee of lawyers and practical oil men to study this phase of regulation and attempt to guide it along lines which would be beneficial to the state and the oil companies as well.

He presented some practical suggestions that, through his experience, he believed would tend to govern production of oil and not interfere, but preserve, the property rights of the land owner and lessee, and not be unduly hampering or burdensome to the operator, and which will also conserve the interests of the public. These included:

Pinching in all the wells drilled in a pool and maintaining a back pressure on them, to secure a greater ultimate yield per acre than would be possible were the wells flowed wide open. "Had

Oil Producing Industries Serve Public At Loss

TULSA, Oct. 10.—Startling figures on the losses the oil producing industry and its investors have suffered in providing the public with its oil because of the rapid fluctuations in the relation of supply to demand were presented to the exposition congress by E. W. Marland, head of the Marland Refining interests, in his address today.

"The producing branch of the oil business has furnished the public with oil during the past 50 years at something like $2,500,000,000 less than cost.

"Last year—1922—I estimate that the producing branch of the industry has furnished to the refining branch of the industry its crude petroleum at approximately $500,000,000 less than its cost.

"The same story will be true this year.

"In 1922, the producers of oil paid out of pocket more money for drilling new wells than they received from the sale of **all the oil** from **all the new wells** and **all the old wells.** They are out of pocket all the money it cost, except drilling costs, to produce the oil that was produced last year.

"I believe that the new wells drilled in the **first half of this year** have cost more than all of the oil sold from all the wells in the United States.

"We have heard a great deal of the three gusher fields in California. Those fields, up to date, have not returned to the operators more than one-half the entire cost to them and will probably never pay out their **full cost.**

"The Burbank Field has sold its oil for approximately $84,000,000, and on account of bonuses, drilling and lifting costs, and royalties alone, has cost over $110,000,000 to date.

"With other corporate and individual expenses and tankage, and pipe lines, it has cost not less than $140,000,000 and is approximately $70,000,000 in the red on the industry's books.

"If the present price of oil continues long, the Burbank Field will never pay out. The Burbank Field is probably the most conservatively drilled and operated field in the history of the oil business in Oklahoma."

we operators in Burbank and Tonkawa been compelled to flow our wells against 100 or 200 pounds pressure, there is no doubt, in my mind, that the ultimate yield of those pools would be greater and the present overproduction be less marked," he stated.

Compelling all wells to be flowed through gas traps or similar devices where the gas can be saved for public use. "Every operator knows that an enormous value in dollars and cents and in heat units to the public and in gasoline to the public is wasted by the method of open flowing of oil wells."

Enactment of laws prohibiting the bringing of oil from its natural reservoir and storing it in surface tankage, unless such tanks are equipped with gasometers, or similar devices, or were connected with absorption plants.

Legislation permitting purchasers and carriers of oil to enter into agreements regarding proration during periods of overproduction to stabilize conditions.

"Intelligent and uniform proration of purchases of oil from flowing wells—wells flowed through gas traps—against back pressure—will prevent overproduction and save the industry and the public from a repetition of the waste seen periodically in new oil fields."

E. R. Perry, vice president of Cosden & Co., presided at the opening program of the Congress Tuesday morning, W. H. Gray, president of the National Association of Independent Oil Producers, presided at the second day's meeting.

Imperial Rotary Shown In Typical Operation

TULSA, Oct. 12.—The Oil Well Supply Co., in addition to maintaining extensive space for entertainment of guests, had a complete rotary drilling outfit in actual operation. This exhibit, which was installed in conjunction with the Young Drilling Engine Co. and the National Turnbuckle Derrick Co., was a center of attraction for visitors. A rotary outfit in operation is still considerable of a novelty in the vicinity of Tulsa, notwithstanding their almost universal use in the Tonkawa field. The well was completely rigged up, and although not actually making hole, was kept going "round and round" constantly during the exposition.

The rotary outfit consists of the largest Imperial California pattern manufactured by the Oilwell company. One of its special features is that this rotary successfully screws together and unscrews casing, drill pipe, and tool joints without manual labor. The rotary proper is made of electric steel, designed to withstand the terrific strains of high speed drilling. All bearings are enclosed and operate in a bath of oil.

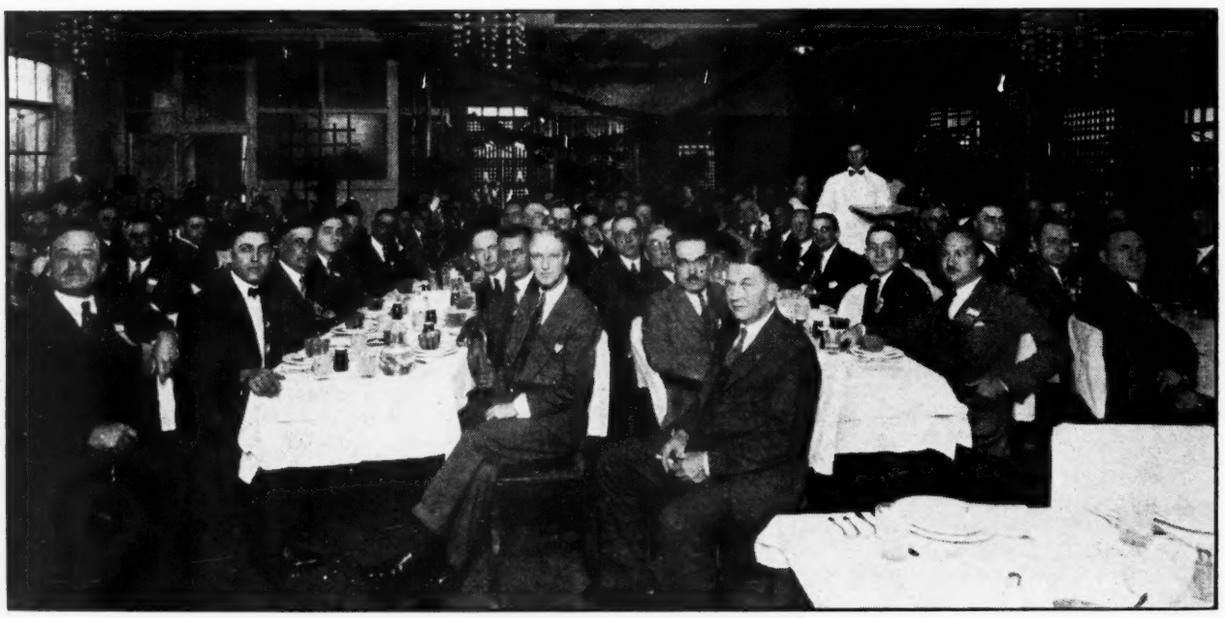
One of the late improvements shown in this rotary is the brake equalizer, which renders equal the friction contact on each brake flange. The Mud Hog slush pumps and oil bath swivel are the same as used on thousands of rotary-drilled wells throughout the world. The 54-inch quadruple Imperial traveling block is extra heavy, self-lubricating, and perfectly balanced. The lower part of the block is fitted with a housing which contains two springs for lifting three or four joints of drill pipe.

Motive power used on this location was the Young Drilling Engine, manufactured by the W. T. Young Engine Co., of Oil City, Pa. This engine operates on natural gas or gasoline, and is a self-contained power unit for both drilling and cleaning out. It can be used with any standard rig or any make of drilling machine, and comes in three sizes, 50, 75 and 100 horsepower.

The National Turnbuckle Derrick Co. of Pawhuska, provided the derrick for this test, installing its standard 80-foot drilling derrick. These derricks are portable, in that they may be knocked down and erected on another location with 100 per cent salvage, and are designed for either cable tools or rotary.

George D. Locke, vice-president of The Barnsdall Refining Co., bumped into an old boyhood friend coming down here on the train. The erstwhile home-town kid was Dudley Polk, in charge of oil industry sales for the Busch-Diesel Engine Co., from their New York office. The two came from Jerseyville, Ill. and the evening they met was spent going over the highly artistic (?) performances of the Jerseyville Democratic Brass Band in which was suspected friend George may have played the bass drum.

Cosden Plant Was Host To Visiting Jobbers



Meals were served in the plant cafeteria. J. S. Cosden as host is figure in the center foreground at head of left table.

TULSA, Oct. 12.—The biggest single gang that milled around Tulsa during exposition week was the special train load of jobbers brought down as guests of the Taxman Refining Co. to visit the Cosden plant at West Tulsa, make a trip out into the oil fields and, incidentally of course, take in the exposition.

The crowd, about 250 strong, reached town the morning of the 10th, starting in at Chicago and picking up recruits at Kansas City. Their pullmans were sidetracked near the plant and they were fed during the next two days at the plant cafeteria which had been made over for the occasion, thus avoiding the rush and confusion in the uptown eating places. Special autos were available to take them to the exposition grounds or any place around town they wanted to go.

The first day was spent by the crowd in an inspection of the big Cosden refinery and taking in the exposition. The next day they were taken out into the old Glen pool to see what an Oklahoma oil field looked like. That same night the train of specials started its return trip. John M. Carson, president of the Taxman Refining Co., was present and active in seeing that the company guests took in all the sights.

On The Lazy Bench At Tulsa Exposition

JOHN P. HERRICK, of Olean N. Y., spent most of the week viewing the sights and at the conclusion of the exposition left for West Baden, Ind., where he expects to rest for two or three weeks. The resting will include a considerable amount of golf. Mr. Herrick, who is one of the best known of the New York operators and has diversified business interests in Olean and adjacent towns, lost his wife early this year and the entire responsibility of maintaining the household, together with increasing business cares, has left him pretty well tired out. Mr. Herrick is recognized as one of the best informed of the eastern producers and has, through stock ownership, considerable interests in Wyoming.

D. C. Wixon, assistant sales manager in the Tulsa office of the Producers & Refiners Corp., kept the name of his company before the public in divers ways, one of them being the distribution of small dictionaries. The company's exhibit consisted of the Parco products, large photographs of the several refineries and a map of the company's producing properties. Gordon T. Granger, formerly superintendent of the Pierce Oil Corp. plant at Sand Springs, now an engineer in the refining division of the P. & R. was present at the exposition booth a considerable part of the time.

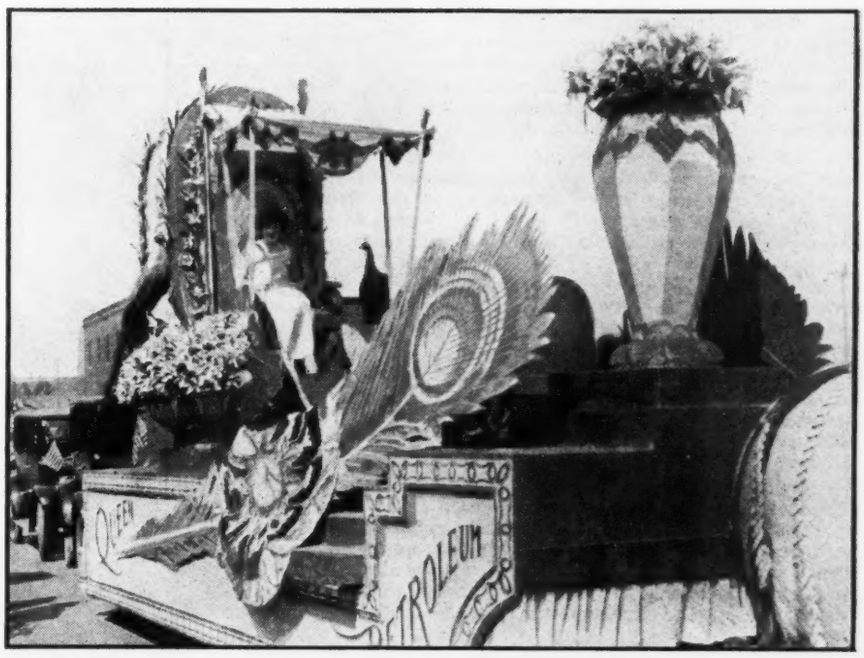
The Reed Roller Bit folks were on hand with a 24-inch roller bit which is plenty big enough to compete the well we tell of in another column as described to us by Bill Long. E. A. Reed, who looks a little like Senator Borah, only not so fierce and determined, was present in a new suit built entirely by hand. He takes care of the Oklahoma territory for the company and Guy O. Danielson, the Texas representative, lent his presence to the gathering.

The Reed people report business good, Tonkawa having given them a busy season and more recently, Powell has been a good thing for them. The nominal head of the company is Mrs. Neils Esperson, widow of the well known Coastal operator and financier, and C. E. Reed, vice-president of the company is in actual charge.

The Blaisdell Machinery Co., of Bradford, Pa., is very much in the running. The ancient and honorable name of this company is known more in connection with air compressors. P. C. Blaisdell, founder of the company, later sold it and it became known as the United States and Cuban Allied Corp. Under the new administration it didn't prosper and the plant in Bradford has been closed for some time. In recent months part of the equipment has been sold a piece at a time.

G. G. Blaisdell, son of P. C., some time ago started under the old name and Blaisdell Machinery Co. is back on the map. Last June the company started to manufacture and sell the pumping jack which was displayed at the exposition. It is an overpull affair with double chain connection running through sheaves and the manufacturers say it provides a straight uniform pull on the rods, eliminating all wear on the stuffing box. The company will come out soon with a pulling machine which will be operated by the band wheel power. Charles Spreter, Jr., sales manager for the company, was in charge of the exhibit.

R. L. O'Brien, of the Rig Equipment Co., Sand Springs, Okla., which company is representative west of the Mississippi River of the O'Brien Steel Construction Co. Washington, Pa., formerly was a western Kentucky operator. He managed the Venture Oil Co. and drilled a number of wells in Warren county which is an experience Mr. O'Brien is trying hard to forget. The sales force of the Rig Equipment Co. has lately been increased by securing A. J. Halpine, of Findlay, O., who formerly was superintendent in the Kentucky district for the Arkansas Natural Gas Co.



Queen of the exposition, Miss De Vern Venzel, daughter of a Tulsa operator.

"Trimo Bill" Wotherspoon, whose sobriquet was conferred by a Goose Creek driller some time ago, started out to make his exhibit international in character by publishing his literature in Spanish. The brilliant idea, which he admits having thought up right out of his own head, failed dismally when he was half way along through the languages. He couldn't say chain wrench in Chinese. "Trimo Bill" had all the big and little wrenches made by the Trimont Manufacturing Co. on display with one of the big fellows under a constant strain of some perfectly staggering number of pounds which we are unable for the moment to recall. He is from Roxbury, Mass., but has circulated so rapidly in the oil country that it is now difficult to tell him from the indigenous variety.

Dr. T. O. Chu, a most polite young man who was generallly referred to as the official representative of China, is soon to leave this country for Pekin where he expects to set up in the practice of petroleum geology.

Dr. Chu spent two years in the University of Wisconsin and the last two in the University of Minnesota where he has been a student of Dr. Emmons. The Chinese rock-hound believes his native land has extensive petroleum resources but that it will require a vast amount of geological investigation as only a bare start has been made.

R. T. Barton, an elderly gentleman of Marrowbone, Ky., had a good time propounding a riddle to all whom he met. He would remark that he was from the county in the state where the first oil well was drilled in the United States. Cumberland county, Ky., was the locale of this event in 1829. Mr. Barton, speaking for publication on the oil prospects of his native haunts, allowed there is a "right smart stir," there now.

Bridgeport Machine Co., represented by a number of its men including President Jim Woods, exhibited its regular line including the Swan underreamers and the display was augmented by a small model pumping jack which has not yet been placed upon the market, but soon will be. Bearings are wedge-shaped knife edge, working in a V-shaped channel, which are held in position merely by exact balancing. The jack is a straight lift proposition warranted to avoid all wear on the stuffing box. The compensating balance feature of the jack was the point which caught the attention and the exhibitors were called upon many times to explain that it was not held in place by any means other than the counter balancing W. C. Meeks, sales manager;

N.P.N. Entertains And Informs During The Show

TULSA, Oct. 13.

PUSHING the serious business of publishing, into the background for the time, **National Petroleum News** turned in during the exposition to help enliven the occasion. Of course the usually overworked news staff—of which there were five on hand—labored as hard as ever to catch the serious and monumentally unimportant facts of the show, but the other seven who represented the paper put on their holiday make-up.

The **National Petroleum News** booth was located at the entrance to Convention Hall. The shade of green which always identifies the magazine was the dominant note in the decorative scheme. A huge chart showing the trend of crude oil production and consumption, which is a feature of the front cover of the paper each month, was displayed at the top of the booth and at night was lighted so that it could be read many feet away. A bulletin board upon which was posted the outstanding news of the day pertaining to the oil industry as telegraphed by representatives of the paper from all over the country, kept the convention visitors advised on the trend of the industry. The reduction in the price of California crude on Oct. 9, for instance, was first made public in Tulsa on this bulletin board.

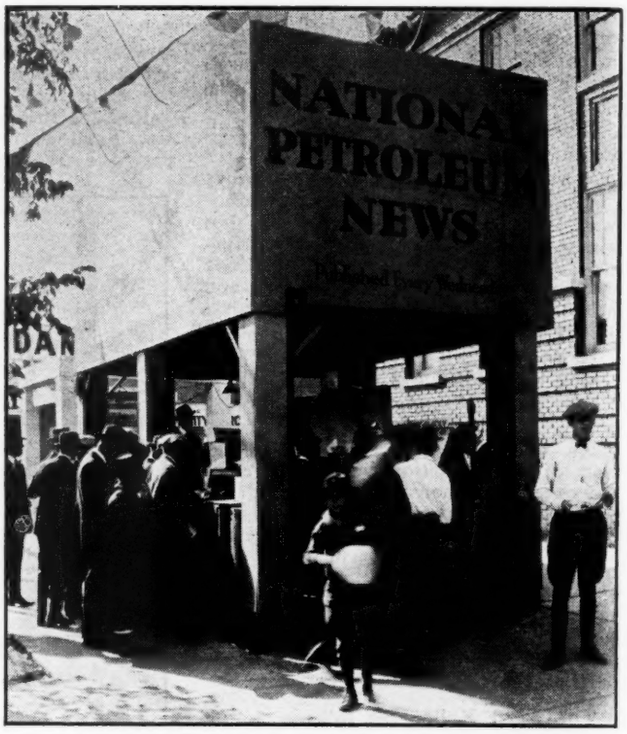
The thing that caught and held the attention, however, was the contest which was conducted each day. On the opening day a gold watch was given to the "handsomest" supply man, as determined by vote. About 15 candidates were in the running on this and Edgar Rittersbacher, treasurer of the American Well & Prospecting Co., Corsicana, Tex., was the high man when the votes were counted. M. L. Westmoreland, sales manager of the same company, acted as the chief of Tammany Hall and worked hard for a day and half in putting his man across.

The second prize given was a leather traveling bag given to the person who could most nearly guess the number of assorted oil field fittings in a box. Three men guessed the number exactly and the bag was awarded by lot to L. M. Stewart, of the Erick Oil & Refining Co., Erick, Okla.

On the fourth day **National Petroleum News** offered a Winchester hammerless pump gun to the person who could most nearly guess the paid attendance for the day. All sorts of guesses were made on this. One man admitted playing a hunch and putting in as his guess his speedometer reading of the day before. L. L. Anthony, the Graham, Okla., representative of the Parkersburg Rig & Reel Co., was the lucky man.

The last contest was also a guessing match. A large distillation flask borrowed from a refinery, was filled with various sizes and shapes of corks and for the person who could come closest to the number, a radio set with loud speaker and powerful enough to hear them singing, "Yes, We Have, etc." in Hawaii, Afghanistan or Sand Springs was offered. This was won by N. G. Bassett, Magneto Ignition Co., Tulsa, but his perspicacity must be shared by five others. Six guessed the correct number of corks, 267, and Bassett won in the drawing to see who would take the radio and give it a good home.

The other correct guessers were H. M. Balch, Sinclair Oil & Gas Co.; W. Elmer Strode, H. & S. Press; S. R. Coggeshall, Tulsa Structural Steel Co.; C. D. James, Clark Brothers Co., all of Tulsa, and Fred L. Herkimer, Savoy Drilling Co., Turley, Okla.



N. P. N. booth at Exhibition

The contests provided much amusement for the visitors and the interest was sustained at a high pitch throughout. Thousands of guesses were made in each event and the contests were open to everybody.

(Continued from page 27)

Jack Becker, special representative; J. T. Long, district manager with Breckenridge, Tex., headquarters and A. A. Buschow, secretary-treasurer, in addition to President Woods, formed the Bridgeport party.

M. B. Skinner bears the distinction of having made the first leak clamp. This was for steam lines. For the past five years the M. B. Skinner Co., of Chicago, has been making pipe repair clamps for the oil and gas industry and its line was on display at the exposition. Mr. Skinner himself president of the company, apparently the most juvenile of his organization, added a lot to his extensive acquaintance during the week in which autumn sport he was assisted by the McMurray brothers, F. A., the southwestern representative with Tulsa headquarters, and F. R. the Pacific coast man with offices in Los Angeles.

John Corrin, vice-president of the Hope Natural Gas Co., Pittsburgh and William B. Way, secretary of the Natural Gas Association of America, also of Pittsburgh, spent three days looking over the exposition. The association was further represented by Mrs. Ethel Lacour, of Cincinnati, business manager of Natural Gas, the official publication of the gas men's organization. Mrs. Lacour was the house guest of Mr. and Mrs. W. G. Long while in Tulsa.

The American Well & Prospecting Co., of Corsicana, Tex., drilled a great deal of imaginary hole with its rotary—the "Gumbo Buster" line. Power was furnished by one of the company's new type twin cylinder 12 x 12 drilling engines. Edgar Rittersbacher, treasurer, and M. L. Westmorelanl, sales manager, were on the job early and late as long as the exposition lasted.

H. C. George, petroleum engineer for the Bureau of Mines at Ardmore, has completed his study of surface equipment on oil wells and the report will appear as a Bureau bulletin in the near future unless some long-winded congressional speeches which were delivered to the clerk and the presiding officer happen to be Red Ball freight over Mr. George's timely study.

Crane & Co., Chicago, were giving out as souvenirs a handy little gauge which would measure the interior diameter of any screwed valve or fitting from one-eighth to six inches. This was devised by M. W. Link and Edmund Burke, who were present at the exposition, as were C. D. Little, general sales manager, H. W. Hoffman, gauge expert and C. B. Sanders, engineer.

Guy O. Danielson, of Houston, salesman for the Reed Roller Bit Co., expressed himself as amazed at the scope of the exposition. His company exhibited a full line of Reed patented specialties, including a 24-inch roller bit destined for export.

Western Supply Co was considerably in the limelight during the exposition both through its exhibits and its effervescent hospitality. The company held open house at the North Boulder offices and the response to its invitation was most gratifying. Certain palatable

Ladies of two Methodist churches served fine chicken dinners for $1 a plate.

and nutritious beverages, such as cream soda pop and orange pekoe tea, were dispensed to the crowd that came in each noon and the output of these was so large that three stalwart men were required to satisfy the enthusiastic clamor. (One of these men we are certain we have seen somewhere before.)

The lunch, displayed on a long counter and consisting of pickles, cheese, ham and the like, was so suggestive of far off happy times that many burst into tears merely at beholding it. The color scheme was vivid and the offices brought back to many memories of the center of activity in early day frontier towns. Withal, however, the air of refinement was so pronounced that one member of the fair and warmer sex wandered in under the impression that she was getting into a charity bazaar. There was considerable singing of the newer songs, one ballad concerning a person named Adeline being in great favor. We pause here to wipe away a furtive tear. Our calloused feelings haven't been so harrowed up in years.

The Rock Island Plow Co., of Rock Island, Ill., was showing for the first time its new power unit for oil field use. This consists of a four-cylinder, 25 h.p. combination engine, designed for burning gasoline, natural gas, or kerosene. The unit is intended for use in pumping beam wells or on cleaning-out jobs, and as its design eliminates the use of the reversible clutch, it is very easy to handle. H. O Bird, factory representative, was in charge of the exhibit, which includes also the Heider tractor, which has already made a name for itself in the Mid-Continent field.

M. O. Swan used to be a pumper for the Prairie Oil & Gas Co in the Skiatook region. He has had a whirl at drilling and at several other things commonly classed as "doing the heavy." Now he is sales manager for the Kansas City Hay Press Co. insofar as its oil equipment is concerned and was in charge of the company's exhibit. The company has been making a pumping jack for the past four years and Mr. Swan says business is so good that he can't get so much as one jack ahead. He reported orders for more than 300 jacks booked at the exposition.

H. R. Leland was is charge of the exhibit of the Columbian Steel Tank Co., Kansas City, and announced that he will take charge of the company's new Tulsa branch office. He will have supervision over the company's sales in Oklahoma and Kansas. The principal feature of this exhibit is a compartment truck tank.

The George D. Roper Corp., of Rockford, Ill., manufacturers of gas stoves anl Trahern pumps, had no exhibit, but W. L. Powers, of the Chicago office, took in the sights.

George L. Andrews, of the crude oil department, Indian Refining Co., Lawrenceville, Ill., combined his visit to the exposition with one to his brother, Elmer Andrews, a superintendent for the Oklahoma Producing & Refining Corp.

It's Brains That Count

TULSA, Oct. 11.—Thomas Galey, Independent operator from Independence, Kans., solved the problem of covering the big exposition without punishing his feet. His second day there he appeared in a pair of heavy golf shoes and two pairs of socks. "Much less of a shock on the feet than thin-soled street shoes and silk socks," he said in explanation.

What Became Of Bottle?

TULSA, Oct. 13.—The Crane Co. boys couldn't let the occasion pass without initiating properly the one member of the party who had never been in Tulsa before. This unfortunate man was Harry W. Hoffman, gauge expert.

Late Wednesday evening evidence in the form of an almost empty pint bottle was planted upon the person of Mr. Hoffman. What the contents were is a matter for Governor Walton's military court to determine. Anyway it was deemed sufficiently incriminating that an arrest was made by a policeman and the culprit marched over to the temporary precinct station on the exposition grounds.

The difficulty in putting the thing over so as to impress Mr. Hoffman with the enormity of his crime lay in the uncontrollable sense of humor of the police sergeant who undertook to question the prisoner. Gay dogs, these Tulsa policemen. The sergeant's mirth grew within him until he finally exploded in a series of booming guffaws and the feline was out of the poke. Anyway, it was good while it lasted.

Take Another Ride, "Jim"

TULSA, Oct. 13.—"Graver Greets You From the Skies", said the little handbills which fluttered over the parade. Thus everybody knew that the Graver Corp. had subsidized, endowed or hired an airplane complete with flier for the exposition.

What most everyone didn't know was that "Jim" Graver, of the company essayed a little trip on high. He was telling all about it the next day. He was particularly eloquent upon the feeling of security he enjoyed all the time he was up. Then someone asked the pilot, who was standing by, what kind of ship he had.

"Well, it's an obsolete model", said the aviator. "The ship is old and too rigid to be properly sensitive to air pockets, so it is hard to handle." Then some more language, indicating that "Jim" Graver had really been riding in a junk heap equipped with wings, all of which, judging from his facial expression, was extra edition news to him.

Sullivan Machinery Co.'s diamond drill in operation.

Refiners Discuss Gravity Crude Scale As Compared With Yields

By J. C. Chatfield
STAFF REPRESENTATIVE

TULSA, Oct. 10

THE average refiner with a skimming plant operating under current conditions is sustaining a loss of 44 cents on every barrel of crude he runs, R. R. Irwin, vice president of the White Eagle Oil & Refining Co., declared at the semi-annual meeting of the Western Petroleum Refiners Association held in connection with the petroleum exposition.

Mr. Irwin's estimates based on averages are as follows: average gravity of Mid-Continent crude 36 degrees Be., averaging price $1.35 per barrel, average pipe line gathering costs 25 cents, average refining cost 40 cents. Total $2.00.

Average yield 30 per cent gasoline 12.5 gallons selling at 6½ to 6¾ cents per gallon, 12 per cent kerosene, 5 gallons at 4 cents per gallon, average return on fuel and gas oil remaining 2¼ cents per gallon, making average net to refiner $1.56 per barrel.

In his discussion of the gravity scale Mr. Irwin said, "The principal factor determining the value of crude oil is still the quantity of gasoline obtainable by skimming or distillation at atmospheric pressure. Practically the only exception is in the case of crude oil of special lubricating value.

"The quantity of cracking stock obtainable is not an important factor, for the reason that practically any crude contains a sufficient amount for present cracking needs. Accordingly pressure stills need not now be taken into consideration in computing the value of crude oil.

"While the present market value of gasoline is negligible and ridiculous, it is still the product most sought for in refining and producing. It follows then that the value of crude oil increases or decreases with its (natural) gasoline content, that is, the content obtained by ordinary refining methods.

"Now the amount of such difference in value is governed not only by the quantity of increase or decrease in gasoline content but also by the comparative market value of gasoline and the other products. For all ordinary purposes of computation, a comparison of the market price of gasoline and fuel oil is sufficient.

"Today's wholesale gasoline market is only four to five cents per gallon more than fuel oil. Applying this to crude oil we can say that, for present refinery and sales purposes, the value of a barrel of crude is increased or decreased four cents for each increase or decrease of one gallon in its gasoline content. We all know that the gravity of crude oil is not a fully reliable indicator of gasoline content or of value, but it is the most practical guide that we now have for buying. Information secured from time to time shows that, while there is considerable variation in the recovery of gasoline from crude oil of the same gravity produced in different fields, it is a reasonably fair estimate to say that for Mid-Continent gasoline crudes testing 30 gravity and above, the gasoline content increases 2 per cent each degree in gravity. Two per cent amounts to .8 of a gallon and at the present differential value of four cents, before explained, would amount to a little over three cents per barrel. This means that on the average and at the present time the value of a barrel of crude oil varies about three cents for each degree in gravity. This would make the range between 30 gravity and 40 gravity crude only thirty cents per barrel.

Relative Gravity Values

"In the foregoing I have considered only the present refining and sales value. For storage purposes the ratio of value is perhaps changed. Crude oil is presumably stored with the expectation of increase in the market value of its products, and particularly gasoline. At present it is reasonable to expect strong increases in gasoline prices. This would affect considerably the ratio of values realized from stored crude used later.

"An increase of five cents per gallon in gasoline and only one cent per gallon in fuel oil would make the spread of value between each degree in gravity of crude about six cents per barrel, instead of three cents, although, as you know, it costs some more to store light gravity oil than heavy, the difference is not sufficient to alter the fact that the ratio of gravity values might be different than for crude to be refined and sold immediately.

"Please understand that I am referring only to the spread of gravity values in line with my subject and not with the level of price.

"Perhaps no logical conclusion in the matter of posting crude oil markets can be reached without some consideration of production costs in various fields and the temporary status of supply and demand but from the standpoint of the buyer of crude, I am of the opinion that:

"The present posted prices of Mid-Continent crudes are not equitable as between the grades specified. The average gravity of the total production of the middle grade is, I believe, somewhere between 35 and 36 gravity. As before shown, the spread of value between this average and the value of 40 gravity crude cannot be more than twelve or fifteen cents per barrel, whereas, the difference provided in the posted market is forty-five cents.

"Then one tenth of a degree in gravity as between 39.9 and 40 gravity makes a difference of forty-five cents per barrel to the buyer and producer which is too much when applied in the same field.

Adjustments Necessary

"I am further of tthe opinion that if the posted market is made on a gravity basis, it should be set and adjusted from time to time as nearly as possible provided such adjustments should not be more than five to ten per cent of the price. The reason this should be the rule is that, if averages of grades are used and wide spreads given in the price schedule, an unequal demand for the various grades of crude oil is created which eventually gives rise to premiums and inequalities in prices so large that the posted market ceases to become operative as a basis for costs. This unequal demand further creates unnecessary gathering costs that would be saved for both producer and refiner if each refiner took crude closest to his plant.

"In concluding this subject, I might say that I believe the gravity method, under conditions before outlined, is a logical method of buying crude oil with the possible exception of periods when the average price of crude oil is low, say $1.00 per barrel or less. When the latter is the case, a flat price for the entire field may be preferable."

D. E. Buchanan, vice president of the Chestnut & Smith Corp., was elected a member of the executive committee of the Western Petroleum Refiners Association at the meeting. A. L. Derby, president of the Derby Oil Co., Wichita, and F. H. Wickett, president of the Sapulpa Refining Co., were elected to the board of directors.

For the most part the meeting held in conection with the exposition was devoted to the presentation of papers bearing on problems confronting the Mid-Continent refiner. P. M. Miskell, vice president and general manager of the Empire Refineries, Inc., presided at both meetings of the

Rain Insurance Saves Financial Bacon

TULSA, Oct. 13.—Rain insurance saved the financial bacon of the International Petroleum Exposition yesterday and today. As a result of the rain Friday the management will collect $4000. Expecting Saturday to be the most busy day of the entire exposition the management took out $6,000 insurance on the afternoon and $8,000 on the evening.

A steady downpour through the afternoon has already earned the $6,000 and at this minute it appears probable that the necessary 1/10 inch will fall between the hours of 5 and 9 o'clock tonight to earn the remainder of the policy. Although exhibits are all under roof, the rains have kept thousands away from the grounds thus far. The banner attendance day was Wednesday with over 12,000 paid admissions.

association in the absence of President George N. Moore.

A note of warning against too great optimism was sounded by F. A. Pielsticker, vice president in charge of refining activities of the Skelly Oil Co., in his address on "The Outlook". It was his assertion that the continued expectation of better conditions in the immediate future is one reason for the ills of the refining industry in the Mid-Continent.

The big spot market of former years will grow smaller and smaller each year in the future, Mr. Pielsticker thinks. He bases his belief on the greater number of distributing systems which are owned by refiners every year. For that reason he thinks that the refiner should not build up huge stocks of gasoline for a spot market when none may develop.

Mr. Pielsticker suggested that the refiners should not depend to strongly on the development of heavy export buying to relieve stocks. His opinion is that foreign production may be adequate to care for the export trade by the time financial conditions in Europe are so mended that the sale of petroleum products takes on normal proportions.

The lack of finances of Mid-Continent refiners to adequately protect them in emergencies is one factor in the situation on which he laid stress. Refiners betting strong on the sales to be made over a period of from 30 to 90 days are forced to throw their goods on a market which will not receive it because of a lack of money to carry the stocks until demand does appear.

F. B. Koontz, general superintendent of Cosden & Co., was unable to deliver his paper on refinery processes and yields from various grades of crude on account of a bad throat It was read for him at the Tuesday session. This paper was reproduced in the Oct. 10 issue of **National Petroleum News.**

W. B. Hamilton, President of the Texhoma Oil & Refining Co., asserted that refiners and producers should work together more closely in his address on the relationship between the two branches of the industry. He said that the refiner cannot afford to complain about the price he is paying for crude at times like this and the producer cannot afford to demand too high a premium when the pendulum swings in the other direction. He reviewed the statistics developed by the Mid-Continent Oil & Gas Association on lifting costs of the producer and gave some interesting statistics on dry holes. In Archer and Wichita countiesin Texas from 1918 to October of this year 3321 No. wells were drilled on separate leases. Of that number 1831 or 54. 6 per cent were dry.

A paper on sales prepared by Myers Gross, sales manager of the Sterling Oil & Refining Co., Wichita, was read to the refiners. He compared the small sales departments of some refineries with the sales effort of other manufacturers. A plant with an annual business of from five to ten million dollars often has only one or two men in the sales office and possibly one or two more on the road. Often manufacturers spend as much on advertising and sales as the entire cost of raw material.

Mr. Gross maintains that selling is not an exact science but is more a human contact between contracting parties. He told how sales letters of his own company were made from 25 to 30 per cent more effective by beginning them with some bright remark on almost any subject attributed to a mythical office boy.

The paper prepared by Mr. Miskell on traffic problems of the Mid-Continent refiner is reproduced in another part of this issue of **National Petroleum News.**

The Sinclair people showed in miniature just how it was done—from well to Consumer.

Expansion In Marketing Greatest Mistake

TULSA, Oct. 11.—Too great expansion in the marketing branch of the oil business has been the unpardonable mistake of the business the past few years, Julius A. Germany, well known Independent refinery of Texas, told his audience at the Oct. 10th session of the general congress. He also urged upon the refiners of the country the establishment of a system for getting up-to-date figures on refinery output and stocks, stating that this knowledge, placed with refinery salesmanagers, would enable them to govern their sales policies and avoid the accumulation of stocks that takes place now.

"There may have been too many refineries built in 1919-20, but the economic loss in overbuilding refineries is not comparable with the unpardonable waste in marketing," he stated.

"I dare say that there are enough filling stations in the Mid-Continent field to reasonably supply the entire territory west of the Mississippi river. Not only that, but filling stations have become things of architectural beauty and places of luxury.

"Should your refinery superintendent be as extravagant as your marketer, you would run your plant without a superintendent.

"The public demands no such expenditure. The cost of selling gasoline today is frequently more than the manufactured price. It cannot be contended that this is good business or even good sense.

"Thousands of men are employed merely to put wind into tires and water into radiators. So long as the industry as a whole commits itself to such unjustifiable cost in distribution, just so long will the public be dissatisfied with the price of oil products. Eliminate the high cost of distribution and you will eliminate a large part of public complaint.

"While the consumer, like the refiner, buys his goods at the best price obtainable, yet he expects the refiner and marketer to make a reasonable profit; but he wants standard goods. I have sometimes thought that every seller of gasoline should be required to keep posted in his place of business a distillation chart of his merchandise under a sufficient penalty to insure the truth of his advertisement.

"This would tend to cut out the mixtures of casinghead and kerosene sold by many Independent dealers during the long summer months. If it is a blended product, it ought to be so advertised. If this were done the consumer would understand why one station can undersell another."

New Gasoline Meter

TULSA, Oct. 12.—One of the exhibits that attracted a great deal of attention, especially from refinery engineers, was that of the Asosciated Suppply Co., San Francisco, displaying the Granberg gasoline and oil meter. The Associated Supply is a subsidiary of the Associated Oil Co. of California, and it was that latter company's engineering department under the direction of Chief Engineer Jurs that developed the meter.

The exhibit was in charge of Lynn A. Schloss of the oil company's engineering department and Elmer H. Jones of the Supply Company's San Francisco office. The meter, while permitting continuous flow of the liquid, works on a displacement basis. It has been tried out by the Associated Oil Co. for a long time, on its trucks, at its fill racks and about its plants, so that all the "kinks" are said to be worked out. The meter operates down to an error of a tenth of one per cent and less.

H. B. Setzler, general manager of refineries of the National Refining Co., with headquarters at Coffeyville, Kan., and S. A. White, the company's purchasing agent from Cleveland, said the exposition was productive of a lot of ideas and equipment hunches for the company. They put in several days on the grounds and Mr. Setzler says he didn't miss a single booth in his close scrutiny.

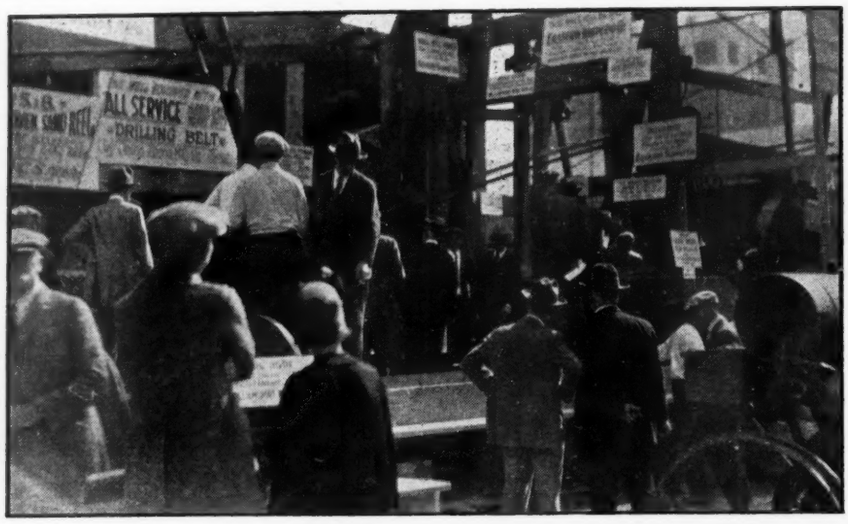
Chicken No. 1 Hits Champagne Pay

By A. F. Hinton

Complete Log Exhibit Oil Co.'s Chicken Farm No. 1 Test.

Formation	Color	Character	Top	Bottom	Remarks
Chat	White	Hard	0	4	
Sewer	Black	Hard	4	7	Some Gas
Scotch	Red	Good	7	9	90%
Corn	White	Fair	9	20	
Beer	Dark	Good	20	21	
Ether Corn	White	Tolerable	21	27	50–50
Bourbon	Maroon	Excellent	27	29	100%
Jake	Red	Hard	29	34	Hole full of Jake

NOTE:—Champagne formation expected after Jake stratum has been penetrated. Well will be shot in this formation Saturday night.



Progress in spudding in and drilling on Chicken Farm No. 1 was carefully checked by the crowd.

TULSA, Oct. 12—Rapid progress is being made on the Chicken farm test being drilled by Hinderliter, Staples, et al, southeast corner location of the International Petroleum Exposition, Tulsa county. Although considerably in advance of production, this location was made on the best geological data available, and should extend the proven area of the field by about 75 feet.

Contract depth for this test is approximately 50 feet, and the hole was started with a 24-inch bit, which size will be carried down as far as possible. Formations in the well are running high, according to the accurate log being kept by the drillers, indicating that the structure is running about as shown on the U. S. G. S. map of Exposition Dome. The drillers are maintaining considerable secrecy as to the progress of the well, but the writer was finally able to persuade Frank Lang, tool pusher, to allow him to see the log.

Frank Lang, partner of Loy Wilson in the Wilson Drilling Co., is tool pusher on this job, and donated his services to the task of rigging up and keeping the work going during the exposition.

The following men have worked on the well: H. R. Wells, Bert Humphries, Smoke Lewis and George Markey, drillers; Ellis Bingham, Earl McLarry, Norman Preston, and Earl Callahan, tool-dressers. These men agree that this was one of the best cable tool outfits ever assembled in the Mid-Continent field and that they "sure could make hole" with it if they had it on a regular location.

Bill Palmer Exploits The Missing Link

TULSA, Oct. 13.—The National Supply Co. has one man in the organization whose past might well be peered into. This is "Bill," Palmer, district manager at Tulsa. The same goes for L. A. Watson, of the Dunn Manufacturing Co.

From the performance of this ebullient pair more than one suspected they had at some time been running a medicine show or acting as barkers for a Tasmanian wild man.

Things were getting a little quiet the second night of the exposition when the two decided to liven things up. They brought into action a box, mounted higher than the tallest man's head and placed in front of the National's booth. Then fitting themselves up with a box apiece to stand on they started extolling the merits of the ground hog that had been captured near Tampico, by force, and especially for the National. Men were required to pay one cent for the privilege of seeing the animal and women and children saw it free.

Here's a sample of the talk that was used in putting the pig across:

"It's free. It's alive. It's eating and drinking. It eats once in four days and it's eating NOW. Now, friends, we like your town and we like your people, but we can't extend this opportunity forever. We are here tonight, only. Tomorrow we go to Turley. Don't go away wondering what this is. You'll always be sorry. Perhaps the last time to see a genuine Tampico ground hog, the only one in captivity."

And so on. The crowds came and went but there was always a quorum present. Most of the folks who saw the "animal" repressed all emotion, so the curiosity of the others was kept alive. From time to time Palmer would give the "pig" a severe beating to hold in leash its ferocious nature. Then he would feed it with biscuit crumbs.

The show ran three nights to capacity houses. The stage properties were increased from time to time. Palmer wore a ten-gallon sombrero the second night and thereafter. A sizeable sum in pennies was taken in at the gate and this has been turned over to a destitute family.

The "ground hog," was a link of sausage.

Urge Buying Of Fuel Oil In Summer

TULSA, Oct. 11.—Purchasing agents in other lines of industry than the oil business attending the district conference of purchasing agents here Oct. 9 were urged to have their companies put up storage and buy their fuel oil in the summer, in the same manner as their coal requirements are covered. They would benefit by a lower price than where they buy on the spot market in the fall and winter, and would save money even though they were on a long time contract through their ability to carry fuel oil in storage themselves in place of making the oil company do it. It was estimated this plan would save the consuming company the cost of its storage in two years at least.

The varying relationship between the cost of fuel oil and crude was taken up, some of the purchasing agents present being apparently unable to understand why fuel oil should not bring the old 60 per cent of crude price. John R. Hadley, Hadley & Co., Tulsa, stated that this relationship probably would never return, since the market for fuel oil is constantly growing and its advantages over coal are being better understood; and that the time was coming when fuel oil would not be considered as a by-product.

Dr. A. P. Bjerregaard, chief chemist for the Empire Refineries, Inc., says increasing demand for motor fuel and greater use of cracking processes will eventually take fuel oil assuch off the market, perhaps in 25 years. Dr. Bjerregaard gave an interesting address on "Oil Fuels."

This is the first meeting for the second district, consisting of local purchasing agents' associations at Tulsa, Denver, Kansas City, Dallas, Fort Worth, St. Louis and Houston. National President C. A. Steele, purchasing agent for the H. K. Mulford Chemical Co., Philadelphia, presided.

The White Motor Co.'s exhibit attracted considerable attention, and Pat O'Connor, petroleum sales manager for the company was kept busy entertaining prominent oil company officials. Some visitors at this booth included George Pohler, purchaser for Cosden & Co., C. B. Singleton, Roxana; Edward Reeser, president of Barnsdall Refining Co., and George D. Locke, vice-president of the same company.

Fuel Oil Characteristics And Advantages As Compared With Coal

By A. P. Bjerregaard
Chief Chemist Empire Refineries, Inc.

Delivered During International Petroleum Congress

ALL petroleum products are composed practically entirely of compounds containing carbon and hydrogen. The only other element with which we are concerned at present is sulphur and this always occurs in relatively small amounts. The relative amounts of carbon and hydrogen present in any particular sample of oil will differ roughly according to the boiling point of the oil. In a general way the lower the boiling point of the oil and the lighter the gravity, the more hydrogen will be present relatively to the carbon and the higher the boiling point and the heavier the gravity the more carbon will be present. Now both hydrogen and carbon, when they combine with the oxygen of the air, generate heat. When a unit weight of hydrogen burns it develops enormously more heat when a unit weight of carbon burns, namely, carbon generates 14,647 b. t. u. per pound; hydrogen generates 62,100 b. t. u. per pound.

It follows that those oils which contain more hydrogen relatively to the carbon will develop during combustion more heat than those oils which contain more carbon relatively to the hydrogen. This, however, relates only when we consider the unit weights. If we consider the unit volumes the relationship is reversed because those oils which contain more carbon, being heavier, have more pounds per gallon than the lighter oils which contain more hydrogen. Perhaps, I might digress here to say that hydrogen in its free state is the lightest substance with which we are acquainted. Carbon in its free state is not the heaviest substance known but it is 22,000 times heavier than hydrogen.

The initial b. t. u. which are used so much in defining the heat value of fuels means British Thermal Unit and its value is the amount of heat necessary to raise one pound of water 1 degree F.

Bearing in mind what has been said about the relationship of gravity to hydrogen content, namely the lighter the gravity of the oil the higher the hydrogen content, and vice versa, the following table will be readily appreciated. It relates to Mid-Continent fuel oils:

Gravity	B. T. U. per lb.	B. T.U. per gal.
24-26	19,200	144,500
26-28	19,300	143,600
28-30	19,400	142,400
30-32	19,500	141,400
32-36	19,600	140,000

You will note the reversal of the increment of values in these two columns as related to gravity. The B. T. U. per pound increases as the gravity becomes lighter, while the B. T. U. per gallon goes the other way.

Weight for weight, fuel oil will give out more heat on combustion than coal, even when the coal is free from ash. This is largely due to the fact that fuel oil contains much hydrogen while coal does not. One pound of fuel oil will average between 18,600 and 20,000 B. T. U. while one pound of extra good coal will only give about 12,000 B. T. U. Furthermore, oil in storage does not deteriorate in heat value, whereas coal deteriorates quite considerably on standing. In this connection it may be proper to say also that oil when stored shows no propensity to spontaneous combustion, whereas coal frequently undergoes spontaneous combustion and sometimes whole coalyards are thus lost.

SOME interesting and valuable comparisons of B. T. U. values of various gravities of Mid-Continent fuel oils and a comparative price table of fuel oil and coal based on a B. T. U. value for fuel oil of 19,000 per pound and 10,000 per pound of coal were given by Dr. Bjerregaard in his talk before the district conference of Purchasing Agents' Associations held Oct. 9 in connection with the exposition.

He also explained methods for testing for water content of fuel oil and took up the matter of sulphur content, pointing out that the popular impression in this regard was erroneous.—Editor.

Considering the cost of B. T. U. only for the coal and oil they will have the following comparative money values:

Fuel Oil cents per gallon	Coal per ton
1	1.70
2	3.40
3	5.10
4	6.80
5	8.50
6	10.25

These figures relate only to the actual B. T. U. delivery of ordinary fuel oil of about 19,000 B. T. U. value per pound and a good grade of coal of about 10,000 B. T. U. per pound.

Fuel oil has an enormous advantage over coal in that the radiant heat from its combustion is an important factor in its use. It is not necessary to impinge the flame directly on the substance to be heated. I know that this is also true in respect to the flame from powdered coal and also from lump coal when burned in a reverberatory furnace. But the temperature of the flame of the burning oil can also be easily regulated or adjusted so that it will be enormously higher than the temperature of the coal flame and, therefore, the radiant energy from the oil flame can be used more effectively than the radiant energy from the coal flame. This factor of course applies more for processes where materials are heated than when the fuel is under steam boilers. Fuel oil, on account of its fluidity, takes up one third less storage space than coal. There are no air spaces between the parts as there are between the coal pieces.

Testing for Water

We can dismiss the question of solid matter very briefly, because these exist

Foreign delegates to the exposition

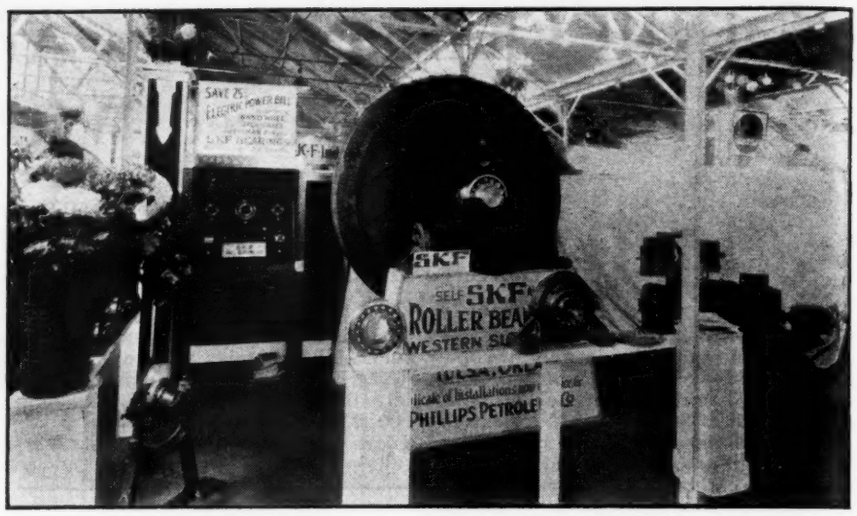
in fuel oils only in extremely minute amounts. In other words, fuel oil is practically free from ash. Water, however, is occasionally found in fuel oils. This is due to several causes. In the first place in the distillation process in the refinery steam is used in practically all cases and, unless great care is exercised, some of the condensed steam is liable to be in the fuel oil. Another source of water in fuel oil is due to the storage of the oil in tanks that have defective roofs where rain water finds its way into the oil. Water will not be found in fuel oil which comes from carefully conducted plants because these two sources of water will be taken care of in such plants.

There is, however, another class of fuel oil on the market at the present time which very often runs very high in water. I refer to the heavy crude oils such as Smackover crude and a few others, which are taken from the wells and stored in open reservoirs exposed to the weather. The water in these kinds of crude may occasionally run very high. Samples which I have examined lately have indicated up to 4 per cent water.

There are two methods of determining water in fuel oil. The one which is the simplest is to put the fuel oil mixed with an equal volume of benzol in the vessel of a centrifuge and spin it for a sufficient length of time to throw all the water to the bottom of the centrifuge tube, whereupon the volume of water may be read from the graduations on the tube. This method is in very common use but it is not always entirely satisfactory because very often the water comes down as an emulsion so that part of the material which is thrown to the bottom and which is called B. S. is oil.

It is of great importance in using this process that benzol is used as the thinning agent, because if gasoline is used it will throw out of solution certain asphaltic substances which will be precipitated along with the water and increase the B. S. but this asphaltic B. S. will of course be false, because the asphalt in question is in actual solution in the fuel oil itself and when injected into the fire will burn equally with the rest of the fuel oil. Another method has therefore been developed for determining water in fuel oil by distillation. I will not go into details of this method now but you will find it described in Tech. paper 323, published by the Bureau of Mines at Washington.

One of the requirements to which fuel oil must conform in order to be practically useful is its ability to flow through pipes, pumps, burners, valves, etc. That quality of oil which is of dominant influence in this property is called viscosity. Viscosity is usually measured in an arbitrary way and is designated by numbers which represent commonly the number of seconds it takes for a certain amount of oil to flow through a capillary opening of special size and length according to the instrument used. In America the most common instrument for this purpose is called the Saybolt Universal Viscosimeter. This instrument, however, is not entirely suited for use with fuel oil, because many fuel oils, when tested by this instrument, show very high viscosities making it difficult to perform the test and giving an erroneous idea concerning the quality of the oil. Therefore there has come into use recently a modified form of this instrument called the Furol Viscosity meter. "Viscosity Furol" represents the number of seconds required for 60 cc. of oil to flow from the Furol instrument, the oil and the instrument being kept at a standard temperature of 122 F. Occasionally other temperatures are used and in such cases the temperature must be designated.



Demonstrating how a hull wheel bearing should run.

The point to which I wish to attract attention at this time is the use of steam for atomizing the oil. When we remember the very high specific heat of steam and when we take into consideration the fact that the steam is introduced into the burner and thus into the fire at a temperature of about 212 degrees F., whereas it is carried away with the flue gases at a very much higher temperature you will see that an enormous amount of heat generated by the combustion of the fuel oil is carried away uselessly in the latent heat of the steam which escapes from the chimney. I do not propose at this time to go into the details of this subject but merely wish to call your attention to it so that you in turn may put your engineers at work on this problem and solve it with respect to each of your individual plants so as to economically burn your fuel oil.

Sulphur occurs in small amounts in practically all fuel oil, the amount varying from a very small amount up to possibly 3 per cent or more. Mid-Continent fuel oil rarely has more than 1¼ per cent and mostly runs from ½ to ¾ of one per cent. Mexican fuel oils often run over 5 per cent sulphur.

More or less prejudice has existed in some quarters against the presence of sulphur, because it has been supposed that this would cause corrosion and other deterioration in the apparatus, such as boilers, where the fuel oil is used. This is, however, an erroneous idea, because no corrosion can take place at temperatures above the boiling point of water. That is to say, when the sulphur in the fuel oil burns it produces sulphur dioxide. This is a gas without action upon iron, steel or brass while it is dry and gaseous. It does, however, have a corroding action on iron and steel when it is in solution in water. But of course at temperatures above 212, namely the boiling point of water, such solution cannot exist. As a matter of practical experience it has been found that sulphur in fuel oil has no corrosive effect, unless the products of combustion are cooled below the condensing point of the moisture contained therein. The fact of the matter is that most coal contains more sulphur than the average Mid-Continent fuel oil.

Recently the British Government after careful investigation changed their specifications on fuel oil from a maximum of 0.75 to 5.00 per cent, having found as above indicated that sulphur has no detrimental effect. Therefore, there should be no limitation on the sulphur in the fuel oil in your specifications because if you put in such limitation, many otherwise desirable fuel oils are liable to be excluded from your range of purchase.

In all the vasty deep of equipment there were islands about which the crowds tarried longest. The No. 1 Chicken Farm well, in the southeast corner of the exposition grounds always had a big gathering. Now and then Harry Wells, daylight driller, would look out and yells that they needn't be hanging around for there were no jobs.

The Sullivan Machinery Co., safe to say, got its story across better than it ever had before. No hole was drilled but, with a machine on exhibition, drills and core barrels and rock cores displayed where the astute wildcatter could see them, the company demonstrated that its equipment was good not only for working out buried structure but that the heavier type would drill a commercial well. E. E. Wagner representing George E. Failing, the state agent for the Sullivan, and R. A. Handley, of Tulsa, a driller, had charge of the exhibit.

S. A. Guiberson, Jr., the man who started quite a lot of talk not long ago by saying that the peak of California production was passed and making several other remarks, wholly optimistic in their nature, got as far as Chicago when he was seized with a bad cold and forced to cancel the trip to Tulsa. Mr. Guiberson lives in Los Angeles and is chairman of the prorating committee of the Southern California Oil Producers Association. He was on his way to Tulsa from Atlantic City where he hecently addressed the National Petroleum Association.

Traffic Problems Of The Mid-Continent Territory Vital To Its Future

By P. M. Miskell

Vice President And General Manager Empire Refineries, Inc.

Delivered During International Petroleum Congress

A TRAFFIC DEPARTMENT is a very necessary part of your activities and covers two vital factors in our business, transportation and rates.

The transportation end of it is never apparent except in times of embargos, car shortages, congestions and priorities. We then realize the value of our organized efforts on these problems, as we have a trained staff of employees who know how to attack these situations, and it is needless for me to point out what has been accomplished in this line in the past.

There are other activities that can be classed as transportation; such as mileage allowances, which is a considerable item in your earnings; the activities of the various car associations, and government bureaus, who are always confronting us with unfair rulings on our equipment and our distribution, all of these rulings tending to work additional hardships on tank car owners and resulting, if they were enforced, in the expenditure of large sums of money with no benefits to be derived therefrom. These are some of the activities coming up from day to day that need careful watching by a trained staff competent to interpret how they affect our interests, and this is one of the reasons you need a traffic department.

On rate activities, I could possibly spend two or three hours discussing various reasons for the existence of this department. Looking back over the last five or six years, there are several important cases which, were they decided against us, would have affected this group very vitally. I have in mind the 15 per cent rate case, General Order No. 28-25 per cent flat increase; General Order No. 28—cancelling export rates Southwest Docket 918 increasing export rates, and a great number of other cases which were successfully handled by this department, and which could only have been successfully fought with co-operation and united action and only by such co-operation and united action will your interests be protected in the future.

Need Carriers' Co-operation

One thing that is to be regretted is we do not have more co-operation from the carriers serving us in these rate matters. My own opinion is the carriers have, either wilfully or through ignorance, failed to recognize the amount of tonnage they procured from the oil industry, and this attitude over the last ten years has resulted in losses to the carriers of millions of dollars in revenue.

THE presentation of some exceedingly interesting data showing comparative rates and mileage from other western refining centers and the Mid-Continent district, and also data showing comparative rates on coal and oil on the ton basis, showing the discrimination in favor of coal was a principal part of the address of P. M. Miskell, vice-president and general manager Empire Refineries, Inc. This was delivered before the Oct. 10th session of the Western Petroleum Refiners' Association.

As a director of the association, Mr. Miskell has devoted considerable activity to rate matters. He urged the further co-operation of refiners in this territory to work out present inequalities in the rate structure.—Editor.

Had they only analyzed their possibilities in the Mid-Continent alone, a fair revision of rates would have prevented the building of fifty per cent of the pipe lines. When one realizes the members of this association alone tender the railroads serving them approximately 350,000 car loads a year one commences to visualize the magnitude of this tonnage. What I have never been able to understand is the attitude of the carriers toward this volume of business.

There are conditions existing today which are contributing greatly to the adverse conditions in the Mid-Continent refining group. Other refining centers are being built up on account of the more advantageous freight rates they enjoy. The New Orleans, Port Artnur and Houston centers are enjoying practically the same freight rates to territories, which are logically your distributing territories, and all these centers have a far greater mileage haul. This is true of the Casper group, and water and rail rates from Gulf Port to southeast points are gradually narrowing down the territory you can serve from a freight rate standpoint.

The attached Table No. 1 gives comparative mileage and rates on petroleum products from Group 3, Beaumont, Texas, Casper and New Orleans to a group of marketing points. I wish to call your attention particularly to the rates to Cincinnati. Formerly Cincinnati drew virtually all its products from Group 3. Now with a distance of 808 miles from Group 3 the rate is 51½ cents per hundred while New Orleans 110 miles farther has a rate of 38 cents. The carriers are willing to haul petroleum products 110 miles farther from New Orleans for 13½ cents less per hundred than from Group 3. The same situation is true to a greater or lesser degree in a large part of the marketing area of the Mid-Continent field.

What is more important to this group of refiners than a correction of this situation? Is it not of the same importance to the carriers, for have we not seen, during the last five years, the shifting of manufacturing facilities to points of distribution with pipe lines carrying crude to these plants? If these rate conditions continue to exist, will we not see more extensions to pipe lines—more refineries in distribution centers—more idle refineries in this group, and the tonnage gone forever, as far as the railroads are concerned?

The carriers have not been fair in giving as consideration on that part of our production which is used in competition with other fuels, as in every instance fuel oil has to pay approximately 100 per cent more freight than coal.

This is apparently a discrimination and should be corrected. Of course it

Table No. 1—Comparative Rates and Mileage from Group 3 and other refining points to marketing centers, showing discrimination against Mid-Continent District.

Point of Origin	Cincinnati		Pittsburg		Detroit		Chicago		St. Louis		Kansas City		St. Paul		Dubuque, Ia.		Cedar Rapids	
	Rate	Mileage	Rate	Mileage	Rate	Mileage	Rate	Mileage	Rate	Mileage	Rate	Mileage	Rate	Mileage	Rate	Mileage	Rate	Mileage
Group 3	51½	808	60½	1,133	56	982	36	765	29½	469	24	309	43	808	34	723	34	635
Beaumont	55	1,137	55	1,187	60	1,290	38½	1,061	32	775	32	771	45½	1,272	36½	1,162	36½	1,074
New Orleans	38	918	38	1,243	45½	1,052	36	921	29½	710	48	862	52½	1,363	41½	1,126	50½	1,054
Casper	65½	1,392	....	.....	68	1,400	51	1,128	35	1,061	45	807	45	843	45	974	45	935

Point of Origin	Des Moines		Sioux Falls, S.D.		Omaha, Nebr.		Cleveland, O.		Philadelphia		Syracuse		Scranton		Indianapolis		Columbus	
	Rate	Mileage	Rate	Mileage	Rate	Mileage	Rate	Mileage	Rate	Mileage	Rate	Mileage	Rate	Mileage	Rate	Mileage	Rate	Mileage
Group 3	33	530	43	690	33½	501	56	1,005	76	1,430	71	1,337	76	1,451	49½	709	54	889
Beaumont	35½	992	45½	1,152	36	963	57	1,189	65	1,630	63	1,521	65	1,710	47½	1,009	57	1,189
New Orleans	50½	1,054	59	1,215	....	.....	45½	1,120	53½	1,280	53½	1,452	53½	1,412	38½	843	43	960
Casper	45	790	55	656	36	645	68	1,501	91½	1,984	86½	1,833	....	.....	61½	1,212	....	.....

will be contended a ton of oil should not be considered by weight, that it should be considered for its heat units and the rate structure made accordingly. I have never agreed with this idea, as, from an effort standpoint, it costs the railroads no more to move a ton of oil than a ton of coal.

Table No. 2 accompanying this paper gives current rates on coal from McAlester, Okla., to a number of points and comparative rates on fuel oil from Okmulgee, Okla., an adjacent city, to the same destinations. It will be noted that in nearly every case for equal hauls coal enjoys a rate approximately half that assessed for the transportation of fuel oil.

In our past efforts as an association, we have accomplished much on the activities I have mentioned. We all have profited to different extents and a number of companies, who are not members of this association, have shared in these results. These efforts have taken a vast amount of time and a lot of money and, if results are to be had in the future, the same amount of time and money will have to be expended. These competitors of ours not members of this association, who are located so these benefits accrue to them, should be expected to at least contribute a share of the expense incidental to carry this work on.

Personally, I do not think it possible to improve our rate situation unless we can agree among ourselves what are reasonable rates and what is a reasonable differential as between groups. What I would like to impress upon the owners and managers of Mid-Continent refineries is that your very existence is dependent on an enlargement of your distributing territory. This problem is not one to be left to your traffic managers alone to work out, but it is the most vital problem you have, for if your rates are not such that you can serve the territory you are entitled to, you will have no need for refineries and will have no problems.

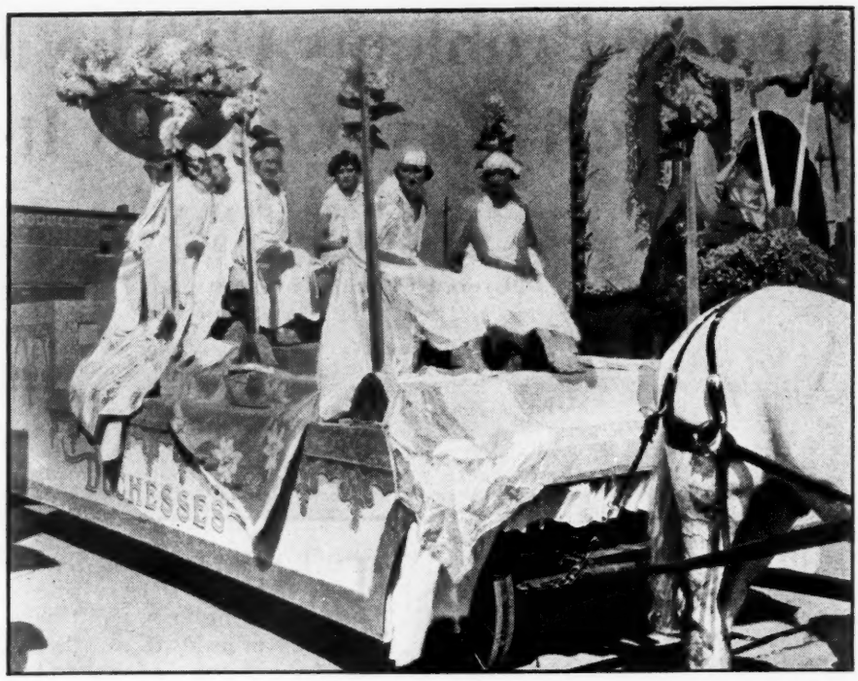
Now, in suggesting this warning it is with no thought of, in any way, implying that your traffic departments are not functioning properly. We have in the Western Petroleum Refiners Association, the most capable and best informed traffic men in the country. However, these men should have co-operation and should be given your unqualified support as the equalizing of these rates for the retaining of your distributing territory is, as stated before, the greatest problem facing you at the present time.

* * *

In extemporaneous remarks following the reading of his prepared paper, Mr. Miskell emphasized the necessity for action on the part of all Mid-Continent refiners, whether members of the association or not, in seeking to regain lost marketing territories.

In the Mid-Continent territory there is located approximately 48 per cent of the refining capacity of the country, he said. The same area consumes but 10 per cent of the gasoline burned in the United States. If the investment in Mid-Continent manufacturing plans is to be preserved freight differentials on an equitable basis must be obtained so that the remaining 38 per cent of the refining capacity can be utilized. Mr. Miskell went into detail in showing consumption of various areas in the country where the Mid-Continent was formerly the source of supply, but from which its business has been wrested by competing areas. "Unless you want to move your refineries to New Orleans and build pipe lines from the Mid-Continent to obtain your crude you must obtain fair rates," he said in conclusion.

Dr. A. J. Paris, Jr., was one of the few representatives present from the old eastern producing fields. He hails from Bradford, Pa., and lamented the fact that more from his part of the country were not present to take in the exposition. "Had they known the extent of the exhibits and how much work the supply houses and equipment people have put into the show there would certainly have been more of them here."



The duchesses got heavy applause in the barge—six Tulsa young ladies attending Queen Petroleum

Inspect Fleming Stills At Bigheart

TULSA, Oct. 11.—A group of refinery operating executives made an inspection of the Fleming process stills at the Barnsdall Refining Co.'s plant at Barnsdall (Bigheart), Okla. They were taken over by P. Gearhart, southwest representative of the M. W. Kellogg Co., who manufacture the equipment for the installations and are interested in the company that markets and controls the process. The Fleming process runs on gas oil and is installed complete by the Kellogg company. The installations at the Barnsdall plant are among the oldest and have been running most satisfactorily, Barnsdall executives say.

The group were taken over in a special car on which luncheon was served, and brought back to Tulsa in the early evening. At the refinery the visitors were shown over the plant by: Fred Holsten, vice-president in charge of manufacturing, Barnsdall Refining Co.; supt. E. B. Gray and T. Coffey, of the Barnsdall operating staff.

Those in the party were: Dr. C. F. Comstock of the Pure Oil Co.; V. R. Oakley, R. R. Dean and J. Green of the Waite Phillips Co.; C. F. Sloan of Sloan & Fosberg, Oklahoma City; J. E. Ells, Superintendent Panhandle Refining Co., Dallas; R. P. Ingram, Superintendent Chestnut & Smith, Tulsa; M. V. McNally, Grandfield Oil & Refining Co.; J. Hanson, Superintendent Inland Refining Co.; J. T. Granger, Technical Superintendent, Producers & Refiners Corp.; Clay Briggs, of the Empire Refineries; H. T. Bennett, Chief Chemist, Cosden & Co.; H. O. Parker, Chemical Engineer and Specialist in hypochlorite treatment with the Mathieson Alkali Co.; G. E. Bodine, Superintendent, Sapulpa Refining Co.; G. E. Berrenger, Assistant Superintendent same company, and C. L. Johnson, Chief Chemist of that company.

Table No. 2—Comparative Rates per Net Ton, Oil vs. Coal, and Approximate Distance in Miles, Sept. 29th, 1923.

From	Okmulgee, Okla. OIL		McAlister, Okla. COAL	
To	Rate	Distance	Rate	Distance
Kansas City, Mo.	$4.10	307	$2.31	315
Omaha, Nebr.	5.50	499	3.89	507
St. Paul, Minn.	7.40	808	4.37	816
St. Louis, Mo.	4.80	470	3.04	566
Chicago, Ill.	5.90	753	4.98	849

Producers Approve Storage In Transit And Rig Iron Standards

Staff Special

TULSA, Oct. 10

APPROVAL of the campaign to obtain storage in transit privileges on tubular goods was voted by the Oklahoma and Kansas division of the Mid-Continent Oil and Gas Association at its annual meeting here today held in connection with the exhibition. Resolutions were adopted endorsing the principle involved, pledging support of the members and urging the railroads to put the practice into effect.

C. R. Musgrave, Phillips Petroleum Co., appeared before the producers to obtain their support of the project. He told of the campaign waged by the Tulsa Purchasing Agents Association with the cooperation of other agencies, including the Western Petroleum Refiners Association.

Resolutions as adopted are to be presented to the general traffic committee of the Southwestern Lines which is to meet on Oct. 16. At that time recommendations of the rate committee which heard arguments for storage in transit at St. Louis recently will be presented.

H. J. Lockhart, chairman of the voluntary committee of manufacturers on rig iron standardization appointed by the American Petroleum Institute, appeared before the association and detailed the accomplishments of the committee in agreeing on a standard set of specifications. The producers approved the committee report and voted to recommend its adoption by the American Petroleum Institute. The association reserved the right to suggest amendments or changes in the report on or before Nov. 25.

A committee of three was appointed to check the suggested standard specifications. Members are C. H. Pape, Selby Oil & Gas Co., R. D. Gwyne, Gypsy Oil Co., and J. B. Steele, Kewanee Oil & Gas Co. The association was of the opinion that the Institute committee report will be satisfactory in all respects but it felt that a careful re-checking by its committee might be of value.

Officers for the coming year were not elected by the association. Under the association by-laws they will be selected by the executive committee at another meeting, probably in November. The association re-elected 75 members of its executive committee and added the following members: Louis Campbell, Magnolia Petroleum Co., Oklahoma City; B. A. Simpson, Simpson-Fell Oil Co., Ardmore; E. B. Reeser, Barnsdall Oil Corp., New York; Frank Buttram, Buttram Petroleum Corp., Oklahoma City; L. H. Wentz, McCaskey & Wentz, Ponca City; George Snedden, Loraine Petroleum Co., Tulsa; R. H. Smith of Tulsa; George N. Moore, Moore Oil Refining Co., Arkansas City, Kans.; and Guy Berry, Big Brother Oil Co., Independence, Kans.

Discussions of the possibility and feasibility of government control of the oil industry occupied the attention of the association at the annual banquet at the Hotel Tulsa. Judge C. B. Ames, general counsel of the Texas Co., was the principal speaker of the evening. He presented an exhaustive discussion of governmental control of the industry largely from the legal standpoint. His address, published in full in the Oct. 10 issue of **National Petroleum News**, asserted that such control will not be possible under the constitution of the United States.

T. P. Gore, formerly United States senator from Oklahoma, followed with an address on "Economics and Legislation." In the course of his address the former senator treated the legislative bodies of the country rather lightly in several instances.

"You ought not to ask the congress to repeal the law of gravity," he said. "If the congress is convinced that the people desire repeal of it they will oblige, however. You should not ask the congress to repeal the law of supply and demand, but if you insist on it they will."

Discussing the proposed investigation of the industry and the probable attempts at regulation, Mr. Gore declared that it is not enough for the petroleum industry to convince their individual senators or representatives or the congress or state legislatures as a whole of the soundness and honesty of the business. "You must convince the congress and the legislatures that you have convinced their constituency of the honesty of the industry," he said.

Mr. Gore declared that the United States is greatly in need of an enlightened and sound public policy both toward the oil industry in this country and toward the unexplored deposits of petroleum in foreign countries. He pointed out that the United States is consuming two-thirds of the oil of the world and is producing a similar amount, although it has but one-sixth of the potential production of the world.

The Oil Men's Hell

F. A. Pielsticker, vice president of the Skelly Oil Co. in charge of refining operations, is rather old-fashioned in some of his views. He believes in a personal hell for the damned if a story he told during the exposition is to be believed.

"In the oil man's hell, it is always 11:50 o'clock at night, just 10 minutes before the lease is to expire unless the oil sand is reached and pay struck. Just one screw more to drill and the well can be brought in. But the boiler flues are out and, although the oil man stands before the fire box door shoveling coal with all his strength, although he is blistered from head to foot by the heat, and although the sheriff and the farmer stand over him ready with shotguns ready to run him off at midnight, the hell of it is that he can't shovel coal fast enough to get the extra ounce of steam needed to bring in the well."

Members Of Executive Committee Reelected

Tulsa

Bates, J. W.; Roxana Petroleum Corp.
Bradstreet, L. G.; Bradstreet Oil Co.
Breene, Frank M.; Winona Oil Co.
Brennan, Judge J. H.; Victor Oil Co.
Chestnut, Thomas; Chestnut & Smith Corp.
Cleary, John K.; Marland Companies.
Cole, H. N.; Pure Oil Co.
Collins, Burt H.; Echo Oil Co.
Craver, Arthur H.; Noble Oil & Gas Co.
Crawford, Jas. K.; Brothers Oil Co.
Dye, Geo. A.; Wilcox Oil & Gas Co.
Farren, Chas. F.;
Franklin, W. C.; Tidal Oil Co.
Griffin, John S.; Griffin Prod. Co.
Griffith, R. A.; Sinclair O. & G. Co.
Gutelius, H. B.; Plymouth Pet. Co.
Hadley, John R.;
Hill, J. H.; Texas Co.
Hull, J. A.;
Humes, R. P. Transcontinental Oil Co.
Hurley, P. J.; Gilliland Oil Co.
Jackson, L. B.
Kelsey, Dana H.; Prairie Oil & Gas Co.
Kistler, W. L.; Prod. & Ref. Corp.
Lovejoy, J. M.; Amerada Petr. Corp.
Malloy, Pat; Constantin Ref. Co.
Markham, J. H. Jr.
Mason, D. B.
McGraw, Henry; Gypsy Oil Co.
McGraw, J. J.; Exchange Nat'l Bank.
Miskell, P. M.; Empire Refineries Inc.
Moore, Clint.
Pape, C. H.; Selby Oil & Gas Co.
Perry, E. R.; Cosden & Co.
Peters, C. B.; Middle State Oil Corp.
Phillips, Waite; Waite Phillips Co.
Sharp, R. C.; Okla. Nat'l Gas Co.
Shea, Judge J. J.
Skelly, W. G.; Skelly Oil Co.
Sloan, J. W.; Okla. Tool & Supply Co.
Titus, C. W.
Tyrell, H. C.; Pulaski Oil Co.
Veasey, Jas. A.; Carter Oil Co.
Walker, P. G. Jr.
Wilson, C. T.; Petroleum Co.
Wrightsman, C. J.; Wrightsman Oil Co.
Franklin, Wirt, Ardmore, Okla.
Westheimer, Max; Ardmore, Okla.
Blue, Burdette; Ind. Terr. Illum. O. Co. Bartlesville.
Kane, John H.; Phillips Petr. Co. Bartlesville.
Davis, Wm. N.; Foster & Davis, Bartlesville.
Straight, H. R.; Empire Gas & Fuel Co. Bartlesville.
Freeland, C. L.; Roland Oil Co. Bristow, Ok.
Owen, Charles; Owen Osage O. & G. Co. Caney, Kas.
Jeffords, W. L.; Chelsea, Ok.
Jones, R. C.; Cushing, Ok.
Champlin, H. H.; Champlin Ref. Co. Enid, Ok.
Landon, A. M.; Independence, Kan.
Easton, T. T.; Healdton O & G Co. Marlow, Ok.
Fink, D. N.; Commercial Natl. Bk. Muskogee, Ok.
McDonald, J. H.; Atlas Supply Co. Muskogee, Ok.
Connolly, D. F.; Texas Co. New York.
Harmon, C. C. Nowata, Ok.
Lawson, E. B. Nowata, Ok.
Colcord, C. F.; Colcord Building, Oklahoma City, Ok.
Shaffer, J. K. D. Oklahoma City, Ok.
McMahon, C. L. Okmulgee, Ok.
Wood, W. E.; Kingwood Oil Co. Okmulgee, Ok.
Black, Geo. E. Pasadena, Cal.
Marland, E. W.; Marland Companies, Ponca City, Ok.
Schock, E. E. Indiahoma Ref. Co. St Louis, Mo.
Howland, Fred B.; Kewanee Oil & Gas Co. Titusville, Pa.
Derby, A. L.; Derby Oil Co. Wichita, Kan.
Marcell, L. L.; White Eagle O & R Co. Wichita, Kan.
Stanley, Fred B. Wichita, Kan.

Petroleum Technologists Defer Action On Name Change

By A. F. Hinton
STAFF REPRESENTATIVE

Staff Special
TULSA, Oct. 12

THE final session of the first meeting of the Institute of Petroleum Technologists was held Friday morning in the high school auditorium and was well attended by a representative group of petroleum engineers, geologists and executives. Although there was some discussion as to the future course of the Institute, particularly with reference to changing its name so that it would appeal more strongly to men engaged in oil production work who are not actually technical men, final action was carried over to be discussed again at the regular annual meeting which will be held in New York next February.

The Institute of Petroleum Technologists is a division of the American Institute of Mining and Metallurgical Engineers, and was organized not long ago to take up petroleum work of the institute, replacing the old Oil and Gas Section. Harry F. Wright, consulting geologist, of Tulsa, has been an indefatigable worker for its success in Mid-Continent territory, and presided over the meetings held here during the International Petroleum Exposition and Congress. E. DeGolyer, vice-president of the Amerada Petroleum Corp., who was partly responsible for the formation of the Technologists' division, also was on hand during the sessions.

The first day's meeting, Oct. 11, was devoted principally to papers on handling of oil on leases, with especial reference to processes for purification of cut oils. A. F. Meston, of the DeLaval Co., was the first speaker. His paper, "Separation and Purification of Liquids by Centrifugation" was well received, and was followed by general discussion, during which he was asked a number of questions. Leo D. Jones and Eugene E. Ayres, both with the Sharples process, followed with papers on "Centrifugal Removal of Wax from Petroleum Lubricating Oils" and "Use and Development of Centrifuge for Petroleum Refinery Emulsions." Mr. Ayres' and Mr. Jones' papers were published in Oct. 10 issue of **National Petroleum News.**

To start off the afternoon session, the UnitedStates Bureau of Mines safety first film, "When Wages Stop" was shown. This film was made in the oil fields of California, and brings out forcibly the advantages of providing safety appliances for employes and for the enforced use of them. The picture showed realistically how accidents occur in the oil fields and on the derrick floor, and demonstrated that most of these accidents are avoidable. The film is built around a story that makes it easy to follow and holds interest to the end.

E. O. Sanguinet, chief engineer of the Tretolite Co., was next on the program, with a paper on "The Chemical Treatment of Cut Oil," which was highly interesting. Mr. Sanguinet reviewed the history of cut oil, and of the many problems it has presented. He told of William S. Barnickel's early experiments along the lines of recovering pipe line oil from emulsions, and of how he finally hit upon the correct chemical formula to accomplish his purpose. Some interesting facts and figures were given as to the cost and efficiency of Tretolite in various fields.

"The Electrical Treatment of Cut Oil" was the subject of a paper by F. D. Mahone, chief engineer of the Petroleum Rectifying Co. of California, one of the pioneers in the work of reclaiming bad oil. Mr. Mahone presented data on the use of his company's process in fields of California and the Gulf Coast, and also in Smackover, which has presented a serious problem on account of the high percentage of cut oil produced there, and the large amounts of it impounded in earthen storage.

J. H. Wiggins, formerly of the Bureau of Mines, and now connected with the Chicago Bridge & Iron Works, spoke on "Evaporation Losses," a subject upon which he has made an intensive study for several years past, and upon which he is an authority. During his connection with the Bureau of Mines, Mr. Wiggins devoted a large part of his time to a study of evaporation losses, and published a bulletin on the subject which first brought home to oil men generally the enormity of losses sustained thereby. His talk to the Technologists concluded the afternoon session of the first day's meeting.

Friday's morning session was opened with a paper by Oliver U. Bradley, of Muskogee, engineer for the Five Civilized Tribes agency, on "Evaluation of Casinghead Gas in Oklahoma Fields." This paper was published in Oct. 10 issue of **National Petroleum News.**

J. M. Lovejoy, Mid-Continent manager of the Amerada Petroleum Corp., delivered an interesting paper on "Effects of Back Pressure on Oil Wells" and presented a chart showing effects of back pressure on oil production, gasoline production, gas production, and proportion of gasoline to gas after back pressure has been applied.

"Recent Exploration for Petroleum in the United Kingdom" was the subject of a paper by E. L. Ickes, geologist, of Zelzah, Calif. Mr. Ickes reviewed the history of the 10 wells which have been drilled in England and Scotland, and gave an interesting description of the general geological features and indications of petroleum in the British Isles. Each well was taken up and described in detail, together with some of the drilling problems.

W. G. Long "Bill", Robinson Pacher Co. Tulsa, dolled his car all up and carried two "old timers" in the parade. Patrick Yorke, Washington, Pa., left and S. W. "Cy" Munn, right

Harold B. Price, Bartlesville, Mid-Continent representative of the Wilson Welder & Metals Co. of New York, concluded the afternoon session with a paper of "Electrical Welding of Tanks." Mr. Price is an authority on this subject, having demonstrated successfully on a number of occasions the practicability of substituting welding for the ordinary riveted joints of large steel storage tanks.

TULSA, Oct. 11.—A new child of the scientific instrument world was introduced at the exposition by W. A. Schlueter, Tulsa representative for the C. J. Tagliabue Manufacturing Co., and also associated with the Refinery Supply Co., of Tulsa, both of whom had exhibits. This newcomer to the instrument field was the Tag-mono air recorder for measuring the amount of air in gas. It is used by gas companies to check up quality of gas they are serving cities and is used by natural gasoline companies to expedite their operating methods. The instrument is automatic. It keeps sucking in samples of the air, measuring them, taking the air content and recording it on a chart, all of which occupies only a few minutes.

Grant Hubley, vice-president of the Oil Well Supply Co., was expected constantly until along about the third day of the exposition when the folks who wanted to see him gave up hope. Mr. Hubley has recently returned from a trip to Europe and doubtless found his desk crowded with business pending.

The Oil Industry's Stake In Research Work In Geology

By K. C. Heald

Chief Of Oil And Gas Division, U. S. Geological Survey

Delivered Before The International Petroleum Congress

OIL producers, refiners, and marketers all have an interest in petroleum geology, for each depends for prosperity on the welfare of the other two. Considering oil geology solely as an investment, they want it to show a profit. Indeed the producer will probably tell us that, unless geology shows him a profit, he will have none of it. He is the man who has to foot the bills for geologic failures, and who has profited most directly from geologic successes.

Of course he is interested in making oil geology pay, and most large operators have had concrete evidence that good geology does pay, although a few may still maintain that the only people whom it pays are the geologists who collect the fees and the drillers who earn wages while establishing records for deep drilling. Unfortunately there are still those who have not learned it is as disastrous to hire a poor geologist as it is to call in a horse doctor to treat acute appendicitis.

The refiners and marketers do not have such a direct contact with geology. They do not hire geologists and get neither the thrill that comes with the birth of a new oil field, nor the pangs of burying their hopes deep in a dry hole. Nevertheless they should every one be supporting geological work of a type which I shall mention, for their prosperity, to be solidly established and continuing, must be based upon the prosperity of the producer. If the operator can reduce his operating costs he can sell his product more cheaply. If the refiners and marketers can cut the prices of their products and still make a profit, they can build up consumption to almost any point they will. The refiners and marketers should urge and support any research that may reduce the cost of supplying them with the raw material which they must have if they are to continue in business, just as the canners of the United States have joined themselves together to conduct research on agricultural problems affecting crops for canning. The National Macaroni Marketers Association has adopted as a part of its research program a study of wheat to learn what wheat is best suited for the manufacture of their product and where the farmers can secure the best seed wheat. The Southern Pine Association has put thousands of dollars in the hands of state and government organizations to investigate and stimulate the reforesting of lands in southern states.

What does oil geology lack? How can it do more than it has done to decrease operating cost? Why is not the present development of the science satisfactory? I assume that, in the oil industry, which has been noted for its rapid growth, there are almost no reactionaries, and that I, therefore, do not have to argue the general principle that no branch of the industry has achieved its maximum efficiency. That sterling statesman Andrew Gump would get almost 100 per cent agreement from oil men when he proclaimed his slogan that "Ox cart methods will not carry you far in an age of aviation" and that it is plain the man who said "Old things are best" never tried to sell eggs.

A COMPREHENSIVE picture of the benefits of general geological work in oil production to all branches of the industry was drawn by K. C. Heald, of the Geological Survey, in his address delivered at the general session of the congress at Convention Hall Oct. 9.

He urged that such work be made cooperative on the part of many companies, and with the idea of studying problems that will be conducive of great future returns rather than immediate financial returns. He offered the facilities of the National Research Council, of which he is a representative.—Editor.

Progress in Geology Vital

We must progress in all branches of the petroleum industry, but progress in petroleum geology is particularly vital. If no improvements were made in methods of refining and marketing it would undoubtedly be a calamity, but the industry would carry on. But cut off the supply of crude and the distress of the refiner and the marketer will be just as acute as that of the producer.

It may seem that undue emphasis is being laid on the value of geology to the industry, or that its present stage of development is more satisfactory than my statements would indicate. I would not intimate that geology has been standing still for the past 30 years, nor disarrange the work of my colleagues in petroleum geology. On the contrary I am proud of that work. The present flood of oil from fields discovered by following the recommendations of geologists furnishes proof all too abundant that the geologist knows a good deal about hunting oil. On the other hand, however, there is abundant and expensive proof that the geologist needs better facts to work with, that he is far from the point of effectiveness he must reach, and that the possible saving to the industry is so great that it can not be overlooked or slightingly passed by.

It has been pointed out that, in 1909, we produced 588 barrels of oil for each motor vehicle, while last year we had 12,000,000 motor vehicles and only 45 barrels of crude to each one. In other words we have learned to make one barrel of oil meet demands that a few years ago consumed many barrels. This has been done by learning to obtain more of certain essential products from the oil, and improvement in methods of fuel consumption. Has there been an equivalent saving in the cost of exploring for oil? Has the percentage of dry holes diminished in proportion? Have those who hunt for oil advanced as rapidly in knowledge as the refiners and the automotive engineers?

Loss in Dry Holes

Last year there were more than 5400 dry holes drilled in the United States, and it has been estimated that the loss to oil companies in the state of Texas alone from this single cause exceeded $15,000,000. This loss is merely the actual cost of drilling. The actual loss is many times that, for when a wildcat well is abandoned at too shallow a depth, and fails to discover an oil pool that deeper drilling would have tapped, the loss due to the unfortunate abandonment of this single well may run into millions. There is no doubt that oil geology can be developed to a point where it can save many of these losses.

After a new oil pool is discovered it is drilled up, and as the edges of the pool are approached in this process, more dry holes are added to those resulting from wildcatting. If there is gas pressure the wells flow for a while. Then they are pumped, with production stimulated by all means now understood. Finally the wells and the field are abandoned as dry.

When the field is thus abandoned, the operator leaves behind him in the sand from 80 to 90 per cent of the oil. In one Wyoming field there are at least 175,000,000 barrels of oil, and probably twice that amount, present in the oil sands, but is is believed that present methods of extraction will obtain less than 7,000,000 barrels, leaving behind 168,000,000 barrels or more.

Must Secure Greater Yield

In view of this enormous loss it is safe to predict that in the future the average extraction will be at least doubled. In the past this loss has not greatly disturbed the operators, and the refiners and markets not at all, for few realized what a tiny part of all the oil in a pool was being extracted by wells. But now that this present inability to extract more than a pitiful fraction of the oil is realized, it is inconceivable that means will not be devised to take from the ground much of this oil that so stubbornly clings to the rock. Extraction from pools after they have

reached a stage that under present methods would mean abandonment, will particularly help the industry; for it will permit old properties to compete on better terms with properties that have the advantage of flush production.

The mechanical problems that will arise must be worked out by the engineer, but first the texture and the porosity of the sands must be studied and the control they exert over both extraction and total oil content determined. This is work for the geologist, the physicist, and the chemist. It will mean both more oil from old properties and economy of operation. The oil industry, when it starts work to achieve these ends, will follow the road blazed by many other cooperative bodies that are carrying on work designed to assure them raw materials and decrease operating costs.

Examples Already Set

For example, the National Board of Fire Underwriters has found it paid to build a laboratory at a cost of more than $225,000 in which they could determine causes of fires and how to prevent them. The Tanners Council of the United States has never regretted starting research work on tanning processes and the substances that are vital to their industry. The returns research has paid to the American Research of Meat Packers are known throughout the world. These researches are supported by hard-headed business men who want a dollar's worth for a dollar spent and who are realizing their desire. They are successful. But none of these lines of research seem to offer the possibilities that exist in a study of oil sands and methods of taking oil from them—a possibility of doubling output without equivalent increase in costs.

There is no apparent reason why the study of porosity and textures of oil sands, combined with figures of extent and thickness of oil sands, will not permit making estimates of recoverable oil in leases and pools that will be far more accurate than those made by present methods. The advantage coal and iron operators have held in their ability to determine in advance just what tonnage they might expect from their properties has often been remarked. Present methods of making estimates do not give the same advantage to oil operators.

One well known and competent geologist, in discussing the Huntington Beach field of California, said he "made an appraisal of the Huntington Beach field in December, 1921, and, bearing in mind the possibility of lower horizons which at that time had not been penetrated, rendered an estimate which has since proved to be at least 100 per cent too low." Reserves of oil may never be determined with the same accuracy as those of coal and iron, but the man who maintains the present methods cannot be replaced by others much more valuable and satisfactory would, 50 years ago, have been heard arguing that steel would never take the place of wood for ship building, and that the pony express was the last word in fast mail service.

Co-Operative Effort Best

There is abundant experience, both in the oil industry and in other industries, to show that it is not desirable nor reasonable to place the responsibility of developing geology so that it will meet the needs of the petroleum industry on the geologic staffs of individual oil companies. Even if the companies allowed their men the time and supplied them with the needful equipment, such action would not be economical. It is a sad waste to hire a number of men of approximately the same ability to learn the same truth in the same way at the same time, when one of these men could be learning it for all the interested parties and the others might be determining facts of equal importance.

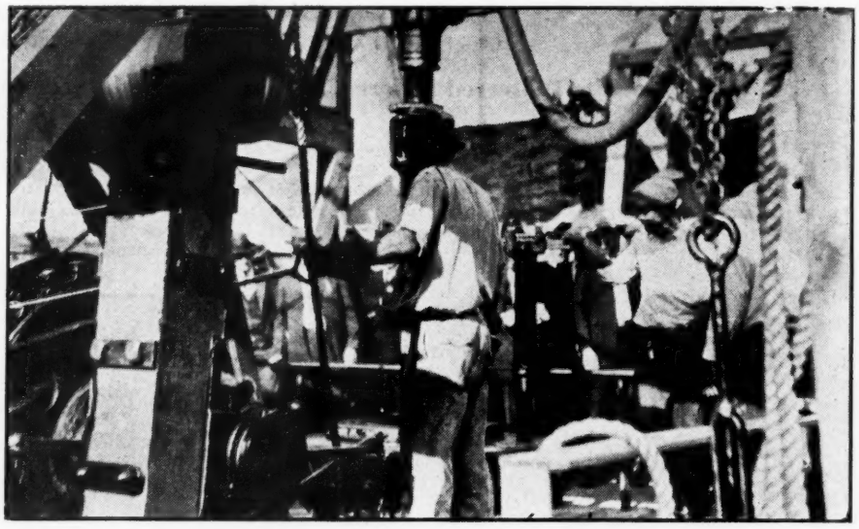
This is one of the reasons why the American Institute of Meat Packers organized to carry on co-operative research studies. It has also been demonstated that there is a strong tendency on the part of individual plants to limit the work of their geologists to activities that promise a quick return, whereas there is general agreement among those who have had charge of elaborate and profitable research work that "fundamental research rarely, if ever, returns a quick profit, but it may easily prepare the way for great wealth."

Furthermore, if the development of petroleum geology is left to individual companies, small operators without the financial ability to conduct independent research work will be at a great disadvantage, which will, in turn, mean loss to the industry as a whole. Finally, and perhaps most important, best results can only be obtained by carefully picked men. Frank B. Jewett, Chief Engineer of the Western Electric Co. points out that the mere getting together of a group of men does not bring a research laboratory into being, and that "the mere dubbing of a man by some research title does not make him any more a real research investigator than sewing a pair of wings on a tunic makes a man a military aviator."

Council Will Assist

The Division of Geology and Geography of the National Research Council has observed the results achieved by co-operative attack on the common problems of an industry by such bodies as the California Fruit Growers Association, Magnesia Association of America, American Gas Association, Portland Cement Manufacturers, and many others. It has observed the absence of similar work dealing with that on which the Petroleum industry is most dependent—the supply of crude—and the need for and possibilities of work on certain phases of petroleum geology were strikingly apparent.

This is particularly true because quick results are not to be expected. If the work could be started tomorrow its results would be needed before they could be obtained. Henry L. Doherty, in his address before the National Petroleum Association on Sept. 20 said "The surplus of oil we now have is being produced under conditions that not only do not insure its continuation, but a rapid decline in production is inevitable, and discoveries must be made at a rate unprecedented before the past few years to even maintain it." In this statement most of the far-sighted men of the petroleum industry concur.



Oil Well Supply Co.'s Imperial rotary rig in action

The National Research Council would therefore urge the formation of a co-operative organization to plan, sponsor and finance work on fundamental problems of oil geology, and it looks to those oil company executives who are broad minded and who have looked ahead to see the future needs of the industry to develop such an organization. Whether it be an entirely new body, or whether it be an addition to some body that already exists is unimportant, since it can function effectively in either contingency.

The essential things are that this co-operative organization should select projects for attack that will yield the greatest return, that it secure the services of capable men to attack these problems, that it place these men where the facilities for work, for conference with men engaged in like undertakings, and for study will be most conducive to results, and that it commit itself to support the initial projects for at least three years, for as was pointed out earlier, quick results are not to be anticipated.

In all but financing the National Research Council can render assistance. It is prepared to help in suggesting problems, finding competent men to handle them, in arranging with government, university, or other research laboratories so that the work may be done under the best possible conditions, and planning methods for distribution of results—in short to do all in its power to make the work effective.

Would Lower Discounts On Coupon Books

Staff Special.

TULSA, Oct. 9.

A THREE CENT differential between tank wagon and filling station schedules was favored by a majority of the members of the Oklahoma Oil Jobbers Association which held its regular quarterly meeting here today during the exposition. The association appeared strongly in favor of the abolition of discounts on gasoline coupon books, or at least that no more than a 2 per cent discount be allowed for cash in advance. Registration at the meeting showed about 50 jobbers in attendance.

Discussion of marketing conditions occupied the entire morning session of the association. President R. G. Cunningham of Miami, opened the meeting and requested C. M. Gentry, Gentry Oil Co., Enid, to take the chair during the discussion.

In discussion of the cash discounts on coupon books a story was told of how the discounts were eliminated at Enid. As soon as one company began giving 10 per cent off on books the Gentry Oil Co. began combating the situation by allowing 10 per cent off on all cash sales. The competing company withdrew its discount on coupon books within four hours.

Considering that the average life of a coupon book is thirty days and that half of the book will be gone in 15 days, Mr. Cunningham pointed out that the jobber allowing a 5 or 10 per cent discount for cash in advance on books is paying a tremendous rate of interest on the money advanced him by his customers when considered on an annual basis. At 2 per cent the rate of interest would be 24 per cent per year.

Various angles were brought out in the discussion of differentials between tank wagon and filling station prices in Oklahoma. The state has been in a chaotic condition throughout the summer with margins running in various places from 2 to 5 cents per gallon. It was the opinion of a number that the operator of a filling station should have at least 4 cents per gallon in order to show a profit.

Opponents of the wide margin asserted that it has always given the retailer an opportunity to pass on a part of the profit to his customer and thus soon break down the price structure.

Hugo Hoval, superintendent of distribution in Oklahoma for the Crew Levick Oil Co., stated that one of the biggest mistakes made by the dealer is in the payment of high ground rentals. He said that even with a 4 cent differential the filling station operator cannot make money if he is paying a ground rental of $150 per month or more.

At the close of the discussion a vote showed that no one favored the 5 cent differential, few the 4 cent and few the 2 cent spread. A majority of the members voted for 3 cents and the officers were instructed to appoint a committee to draw up resolutions showing the attitude of the association.

At the afternoon session W. C. Platt of **National Petroleum News** talked on the jobbers opportunity in greater economy and better merchandising. He argued that, owing to the tremendous size of the big compaines, the overhead and slack had come to be a most important item in the expense of operation, an item that the independent jobber didn't have except only in a slight degree. The business world, he said, had come to look upon rows of tabulating machines and statisticians as evidences in themselves of great efficiency, whereas they are only a somewhat vain effort to maintain a semblance of efficiency.

The Independent oil jobber is in a position to operate more efficiently and at lower cost than the big companies, all propaganda to the contrary notwithstanding. By applying this opportunity, this personal touch with their own organizations and their own customers to the merchandising problem he said the jobber could go on getting business in greater percentage than the big companies.

Fred J. Slack, of the National Petroleum Mutual Fire Insurance Co. of Philadelphia, told of that organization's efforts in reducing the cost of insurance, how before the organization of that company he himself had sold insurance on oil plants in Oklahoma at a "cut rate" of $4.62 while now the average rate of all companies is around $1.25 to $1.30 due to the competition of the Mutual. President Cunningham of the association said he had a striking example of the value of the Mutual. When he started in business he paid better than $6 and neither he nor his insurance broker could get a lower rate or a re-inspection of the plant. When he heard of the Mutual he took out a policy and within thirty days the old stock companies had re-inspected his place and cut their rate to less than $2.00.

H. G. James of the Derby Oil Co., Wichita, Kans., and president of the Missouri Oil Jobbers Association, talked of general conditions, saying that the newly arrived oil jobber doesn't seem to realize that the industry has seasons of fairly good margins and then seasons of little or no margins and that a marketing business must be run on an average basis. He decried the statements of some oil men who have talked to the public of the "robbery" in the gasoline prices of the past year. He said it wasn't robbery in the first place and second it inflamed the public and invited competition of a cut-throat variety which the industry can't afford to have. He believes the situation will right itself very quickly and that narrow margins will shortly obtain and then for some time.

These talks were followed by remarks on the general situation, practically continuing the discussion of the morning. It was finally decided to name a committee to ascertain more exactly just what margin should be allowed the curb pump and what margin marketing conditions warranted.

The membership present also instructed the directors to call an early meeting of the association at Oklahoma City. The directors held a meeting immediately following.

I. C. Maust, oil jobber operating for about three years as the Maust Bros. Oil Co., Falls City, Nebr., motored to Tulsa for the exposition and brought his wife and small son and daughter. He found they were as anxious to make return trips to the exposition as he was himself.

The Deacons—not the church deacons, but Andrew "Andy" and W. T. "Bill"—with a lot of surfacing material having the general characteristics of paint, and such other things as may be necessary at a properly conducted exposition, came down from St. Louis and opened a booth. This showed some other people how to display advertising when you have a product you can't display of itself and otherwise made themselves favorably known to the trade. They are from the St. Louis Surfacer & Paint Co.

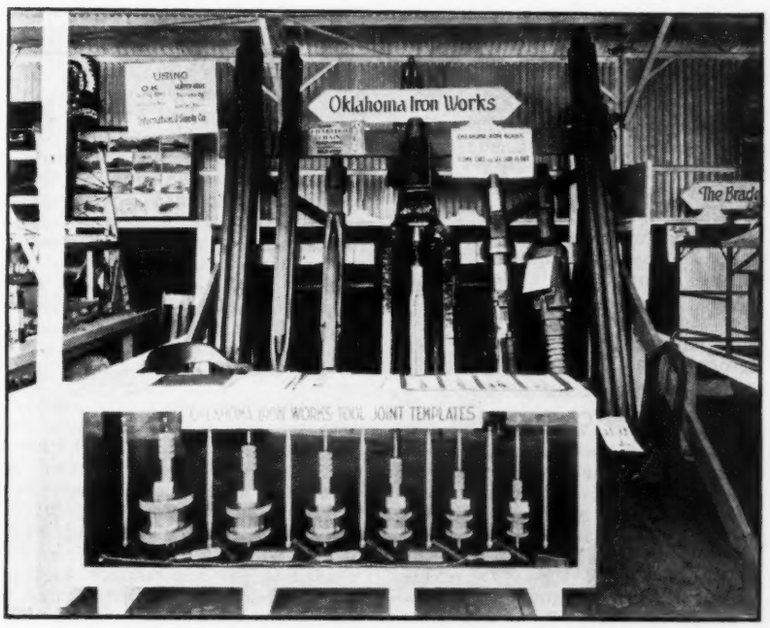


Exhibit of Oklahoma Iron Works

Relation Of Supply Man To The Producer; His Aims For The Future

By S. Clarke Reed
Vice President Oil Well Supply Co.

Delivered Before The International Petroleum Congress

THIS morning we are particularly interested in production, or rather one phase of production—the relation of the supply man to the producer. Speaking for the supply man, it seems to me that the subject does not cover the entire case. The word relation connotes a kinship or a contact, possibly, or a common interest; whereas, to our way of thinking, we are not outsiders, having merely an incidental interest, but are really an integral part of this great industry and must be so considered.

We are not self-seeking, selfish parasites fattening on the needs of the producers, but are vitally and constantly interested in everything that affects not only the producer but the distributor as well. Not only do we claim that the supply man is an integral part of the industry, but we go farther and say that he has played an important part and will continue to play an increasingly important part in the development of the industry.

My presence here at your request is evidence of the importance of the group I have the honor to represent. In the enormous expansion of the petroleum industry and the consequent problems which have arisen, the real position and the proper functions of the supply men have been overlooked, but his importance to the producer particularly should not be forgotten.

In the first place, a tremendous amount of capital has been invested by the supply companies in plants, machinery and equipment for the sole and exclusive purpose of building oil field equipment. There are several companies which manufacture this and nothing else. This means that the producer gets the benefit, not only of the reduction in cost due to specialized manufacture, but he also benefits by improved machinery and equipment, developed by trained engineers whose sole job it is to take and adapt all the ideas and improvements born of the field man's experience.

The supply man has always been quick to improve the quality of his goods, and through the experience of long years of co-operative effort, the producer has come to regard the supply man as a willing, intelligent, and valuable partner in the constant struggle for improved methods of production.

Supply Man is Contact Point

The supply man has become the channel through which the manufacturers of what may be termed incidental lines of equipment reach the producer. By this I mean the goods made not exclusively for oil trade, but which are essential to it, for example, brass goods, packing, fittings, cables, etc. If the manufacturers of those incidental lines should attempt to market their goods through their own sales force, not only would the effort be most expensive to the manufacturers, but it would be almost fatal to the producer because this expense would necessarily fall on him. An ordinary supply company branch store carries from six to eight thousand different articles and the volume alone results in decreased marketing costs.

Not only is the producer unable to establish a sufficiently intimate contact with the manufacturers of the multitudinous articles used in the production of oil, but the difficulty of adjustment for unsatisfactory material would prove an unsurmountable barrier to efficient business practice. The supply man sells an article and of necessity stands back of it. If anything goes wrong, the customer has but one factor to deal with.

Its Availability

In the third place, the supply company markets its goods where they are immediately available. No matter where the pioneer develops the oil bearing sands and finds the oil, there you will find the supply man. A great deal of praise has been given, and justly so, to the wildcatter and the pioneer; but I want to pay my respects to the modest, hard working, uncomplaining branch store man who undergoes all the hardships and inconveniences of frontier life in order to be of service to the producer. He is not spurred on by dreams of fortune in the gusher. He has no immediate hope of tremendous gain. He is actuated only by the thought of service to his customer and the success of his employer, and I believe he is entitled to no small praise for his part in such pioneer work.

Now, as indicated, the important problem is to get the goods where they may be most quickly and easily put to use by the producer. Necessarily, this means increased costs, for, if instead of putting his store in the midst of the field, the supply man were content to sell his stock from railroad centers, the cost would, of course be lower, for local transportation charges would be eliminated, but the time lost in getting the goods to the well would render this absolutely unsatisfactory.

In passing, it might not be amiss to call attention to the fact that, while the branch store is placed at the point most convenient for the producer under all circumstances, it is placed there because of the needs of the producer, and the supply man is perfectly willing to market his goods in this way even at a higher cost. There has been a tendency of late on the part of some of the larger producers to use the facilities of the branch stores for emergencies or for the smaller purchases, depending upon direct purchases from manufacturers for the larger equipment.

This practice had its inception during the war, when deliveries were more or less unsatisfactory and there was fear of shortage of material. Many producing companies also were persuaded to encourage the irregular trader, the so-called bootlegger. A great deal of hoarding resulted, and the normal flow of trade was more or less disturbed. When the depression came in 1920, many companies were carrying large stocks of their own and were forced to take considerable losses through depreciation of inventories.

Bootlegger Passing Out

Fortunately, both these unusual and unnecessary practices are being eliminated. The supply companies are prepared to take care of all the demands of the producer, and the producer is coming to realize that it is necessary to carry only enough equipment for his immediate needs, and that it is much more satisfactory to deal with a permanent, reputable supply house, who has a permanent interest in the business, with stores in every active field, rather than an agent or a trader whose sole interest is merely the securing of an order, and whose service is far from satisfactory.

The relation of the supply companies to the producer of other countries has always been close. The petroleum industry has been developed largely by America. It was started in this coun-

IT TOOK the depression following the war to impress upon the oil producing companies the true function of the supply house, Mr. Reed pointed out in his address before the general congress, Oct. 9. They had previously been tending to buy their immediate needs from branch stores and buying their large commitments direct from manufacturers. Depreciated inventories forced upon them then have made them largelv give up this practice, he stated.

Standardization, the elimination of unnecessary styles and sizes, is being taken up by manufacturers of oil field equipment, he said, pointing out that one manufacturer has reduced his styles of sand reels from 75 to 18. He expects great economies in this direction to be effected by joint action of the producer and supply man.—Editor.

try and certainly most of the equipment has been made and improved in this country. When men from other countries began the development of oil fields in their own country, or its colonies, they turned to America for advice and guidance.

Naturally, they came to the supply man first and, as a result, there has grown up an intimate contact which has been mutually profitable. The supply man has not only been a seller of merchandise, but a consulting engineer, giving the benefit of American experience but also has acted as an employment agency, supplying the equipment and also the trained men necessary for its successful operation.

Finances the Producer

The petroleum industry is now going through one of its periodic depressions. Such periods bring to mind another most important function of the supply company. As a group we have always encouraged the producer, large and small, in many cases, assuming a large part of their financial burdens. When the depression comes, and the producers' income curtailed, the supply company assumes the function of a banker until the tide turns and the opportunity comes to liquidate the obligations.

I believe I am safe in saying that no other business in the country carries so large a line of open accounts, the only security on which is the moral responsibility of the debtor. We are not complaining, nor suggesting a remedy; we are merely stating a fact, and developing our contention that the supply company is an integral part of this industry and a most important one, too.

Having touched on some of the important points of contact between the supply man and the producer, the question naturally arises, how can this contact, this relationship be improved? The answer is, by a closer co-operation, a more intimate, more intelligent understanding of the other fellow's point of view and more opportunities to discuss the difficulties and problems common to both.

Price Not First Consideration

The supply man would like to see more consideration given to quality and service rendered rather than the price. He is ever on the alert to improve the quality of his product, but if the pressure of competition forces the price down and the purchasing agent makes his decision based on the price without considering the ultimate replacement cost, necessarily the inevitable result will be the cheapening of the product with a consequent loss to the producer. The field man is entitled to the best equipment possible. There are so many unavoidable difficulties and dangers in drilling, that all unnecessary obstacles should be removed by giving him equipment of the very best quality, regardless of price. I know that is a broad statement, but I believe a careful consideration of all the factors will lead to this conclusion.

I touched on the location of branch stores. The wildcatter does not always make the oil field convenient to a town and so we are forced to establish our stores in the open country. Of late years this has meant a tremendous increase in the cost of doing business, for not only are we forced to make the original investment in stocks and accounts, but we must often purchase ground at highly inflated values, and then put up buildings to house our men as well as the stock. As our prices are highly competitive, contrary to the general impression, this increased cost necessarily bears most heavily on the supply companies. We hear much of the increased cost to the producer and we want him to know that he carries no monopoly.

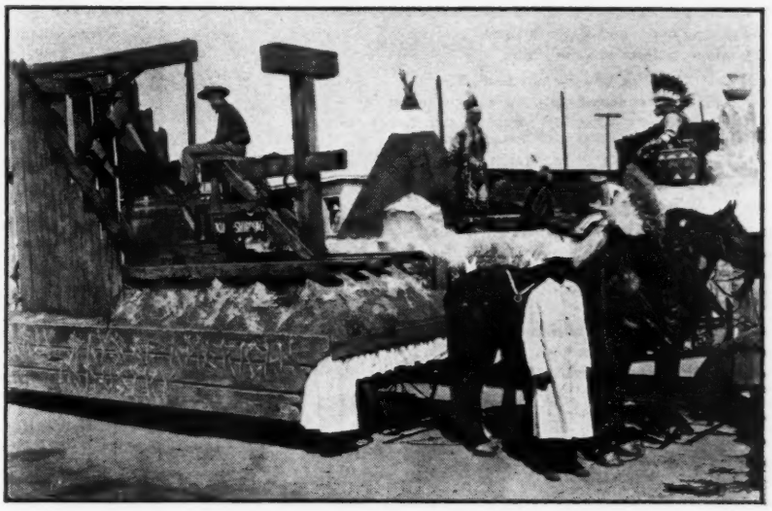
Standardization Coming

Finally, the greatest service we can render is in the creation of standardized equipment. By this I do not mean standardization based on interchangeability, but I do mean the elimination of all unnecessary styles and sizes. By this I mean equipment, adequate for all contingencies, eliminating all variations bases merely on individual or local prejudices and practices. The whole industry today suffers from an undue burden of manufacturing costs, due to unnecessary variations of standard sizes. I know of one manufacturer who reduced his styles of sand reels from about 75 to 18. Another case was that of drive shoes, the various sizes manufactured being reduced something like 30 per cent. Great economies in this direction can be effected by joint action of the producer and supply man.

The American Petroleum Institute has already taken cognizance of this matter, and has several committees working on the standardization of casing and drilling tools.

This subject is having attention, but it is so important that every effort must be made to encourage and extend the movement.

Just now the petroleum industry looms large in the minds of the American people. We are in the limelight. We must justify our position. We must show what a wonderfully efficient industry we are. The producer and supply man, the refiner and the distributor must co-operate to the fullest extent in a concentrated effort to eliminate all waste and so pass on to the ultimate consumer the results of such co-operation in the shape of reduced cost for the finished product.



Parade float depicting early drilling in this country

Two Wrongs Never Made One Right

TULSA, Oct. 11.—T. J. Gay, Gay Oil Co., Little Rock, Ark., was one of the first jobbers to show up at the exposition. After tiring himself out looking at the exhibits he sat down and told of his experience on a long motor trip through the east this summer. One of the points he visited with not much time for sightseeing was Providence. Here he has an old business friend, L. D. Pierce, of the Pennsylvania Petroleum Products Co. Right on the spur of the moment, however, the name of his company slipped Mr. Gay and he didn't have time to call all the Pierces in the Providence directory.

So he regretfully gave up the attempt to pay a social call and went on his way and when he got back home he refreshed his memory and wrote Mr. Pierce why he failed to pay him a visit.

"That makes us even," Mr. Pierce wrote back. Last winter you passed right in front of me on the polo grounds at Miami, Fla., but I was tongue-tied for the moment and before I could call out you were out of hearing and I could not find you again around the place."

Col. U. G Lyons, president of the National Petroleum Association and of the Conewango Refining Co., came on from Warren. Pa. as a delegate. He put in several days most of the time poking around among the exhibits, which he said were worth many times the cost and trouble of the trip out.

John M. Crawford, head of The Parkersburg Rig & Reel Co., Parkersburg, W. Va., came on a hurry trip from Boston where he had been attending a meeting of the directors and executive committee of the National Chamber of Commerce. He said those meetings are the best run and greatest time-savers he ever attended, as they won't let a man speak twice on the same subject. Mr. Crawford put in a good bit of his time at his company's booth.

These Equipment Companies And Supply Men Put Tulsa Exposition Over Strong

Acme Foundry & Machine Co., Coffeyville, Kansas.
Palmer control heads and Bolskirk squib.
E. C. Graham, Salesman, Coffeyville.

American Cast Iron Pipe Co., Birmingham, Ala.
Cast iron pipe for condenser coils, gas and gathering lines.
E. L. Gilder, representative, 716 Scarritt Bldg., Kansas City.
H. D. Hughes, representative, Dallas, Texas.

American Car & Foundry Co., 165 Broadway, N. Y.
Sectional parts of tank cars, outlet valve and bolted dome covers.
Thomas C. Andrews, sales agent., St. Louis, Mo.

American Well & Prospecting Co., Corsicana, Texas.
Gumbo buster rotary drilling rig complete.
Edgar Rittersbacher, treasurer.
M. L. Westmoreland, sales mgr.
E. M. Braxton, mechanic.

Associated Supply Co., San Francisco.
Granberg gasoline and oil meters.
Elmer H. Jones, sales manager.
Lynn O. Schloss, engineer.

American Schaeffer & Budenberg Corp., Brooklyn, N. Y.
Recording and indicating thermometers and relief valves.
G. A. Bing, sales manager, Brooklyn.
O. V. Kluenter, salesman, Tulsa.

Alexander, R. R., Tulsa.
Max Jack Frame.
R. E. Alexander, manufacturer, Tulsa.
Charles E. Blair, manager, Tulsa.

American Metal Hose Co., Waterbury, Conn.
Flexible all-metal steam and oil hose.
Alex B. Friedman, agent, Chicago, Ill.
R. B. Munger, Chicago.

American Radiator Co., Chicago.
Sterling oil condensing sections.
L. M. Butler, manager, Buffalo.
C. A. Olson, salesman, Chicago.

A-1 Packer Corp., Eldorado, Kansas.
Oil and gas well packers, swabs and plugs.
L. M. Robinson, president, Eldorado.
G. M. Seamster, salesman, Wichita, Kansas.
B. E. Joslin, secretary, El Dorado.
C. F. Walton, treasurer, Tulsa.

Burns Temper Screw Co., Okmulgee, Okla.
Burns tubular temper screw.
F. G. Irvine, manager, Okmulgee.

Black, Sivalls & Bryson, Inc., Bartlesville, Okla.
Vapor pressure steel storage tanks
A. H. Black, president, Independence, Kansas.
C. P. Buck, manager, Topeka, Kansas.
E. N. Black, treasurer, Tulsa.

Brown Welding & Machine Co., Breckenridge, Texas.
Devils' steel hand, Devils' pitchfork, fishing tools for sucker rods.
C. H. Brown, owner, Breckenridge.
Cleve Johnson, representative, Fort Worth.

Bradford Motor Works, Bradford, Pa.
Pumping outfits, valves, working barrels, ball seats, etc.
George B. Morris, manager, Bradford.
M. F. Brennan, representative, Tulsa.
R. G. Hawley, superintendent, Tulsa factory.

Baldwin Chain & Mfg. Co., Worcester, Mass.
Straight side bar and case hardened rotary chains. General lines of steel roller chains.
George J. Fix, representative, Dallas.
H. V. Greenwood, general representative, Chicago, Ill.

Bridgeport Machine Co., Wichita, Kansas.
Swan underreamer, belts and drilling tools, Kliewer casing pitch, Bridgeport straight left pumping jack.
J. K. Becker, special representative, Wichita.
W. J. Shea, representative, Kansas City.
H. W. Young, local manager, Tulsa.
C. W. Meeks, sales manager, Wichita.
C. B. McElwaine, representative, Wichita.

Bruce Macbeth Engine Co., Cleveland.
165 H. P. Water cooled gas engine.
J. B. Simler, district manager, Tulsa.

The Braun Corporation, Los Angeles.
Gasoline tester, oil stills, asphalt apparatus, pyrometers, microscopes.
M. J. Holmes, sales manager, Los Angeles.

Brown Instrument Co., Philadelphia.
Thermometers, pyrometers, pressure gauge recording instruments.
F. M. Poole, district manager., St. Louis
W. R. Watts, salesman.

Braden Company, Tulsa.
E-Z Bilt sectional steel buildings. Exhibits were housed in their buildings.
J. G. Minharlson, general manager, Tulsa.
I. V. Horner, chief engineer, Tulsa.

B. & C. Machine & Foundry Co. Tulsa.
Neilson safety sucker rod elevators and hooks. Standless swivel swabs, rope sockets, companion flanges.
W. P. Cunningham, president.
J. T. McCullough, treasurer.
Earl W. Miller, sales manager, all of Tulsa.

Blaisdell Machinery Co., Bradford, Pa.
Convertible pumping jack.
C. A. Spreter, Jr., salesman, Bradford.

Bradford Rig & Reel Co., Bradford, Pa.
Rig irons, tanks.
F. J. Bradford, president, Tulsa.
H. H. VanHorn, secretary, treasurer, Tulsa.
C. W. Greiger, sales manager, Tulsa.
F. M. Bohn, salesman, Tulsa.

Bovaird Supply Co., Tulsa.
Bovaird Grip casing and tubing elevator and spiders.
W. M. Bovaird, secretary, treasurer, Tulsa.
W. J. Bovaird, president, Independence, Kansas.
Charles Shugart, sales department, Tulsa.
F. D. Bovaird, vice-president, Tulsa.

Bessemer Gas Engine Co., Grove City, Pa.
165 H.P. type 10 direct connected compressor.
C. B. Craig, general manager, Grove City, Pa.
H. D. Murray, designing engineer, Grove City.
B. L. Patter, district manager, Tulsa.
F. Hull, salesman, Ponca City.
L. Scaggs, manager, Mexia, Texas.

Baird Supply Company, Tulsa.
Ajax Carburetor for oil field pumping gas engines.
Lynn D. Baird, president, Tulsa.
Walter K. Campbell, vice-president, Tulsa.
R. Johnston Slingluff, manager, Tulsa office.

Crane Company, Chicago, Ill.
Cast steel, cast iron, brass, ferro steel and forged steel valves and fittings, dealers in pipe and engine supplies.
C. D. Little, general manager, sales, Chicago.
W. M. Link, sales engineer, Chicago.
M. E. Blueler, manager, Tulsa branch.
C. B. Sanders, specialty engineer, Tulsa.

Cities Service Oil Co., Chicago.
Oil products.
C. E. Holt, special representative, Skiatook, Okla.
L. Kurtzman, advertising manager, Chicago.
G. E. Segellmist, lubricating engineer, Topeka, Kansas.

Chain Belt Co., Milwaukee.
Rex Chabelco chain for rotary and standard rigs.
W. H. Brandt, advertising manager, Milwaukee.
T. F. Scannell, business manager, St. Louis.
R. G. Davis, factory representative, Milwaukee.

Cosden Co., Tulsa, Okla.
Chemical and Physical Laboratory.
H. B. Beckley, Tulsa.

Columbian Steel Tank Co., Kansas City.
Vapor proof bolter tanks. Gas-tighting devices, partition mounted, three point supported truck tanks, safety fire-proof floating decks, buckets, cause funnels, etc.
H. R. Leland, district manager, Tulsa.
J. S. Foley, southwestern representative, Dallas.
"Tanks" McPhail, representatvie, Ardmore, Okla.
E. E. Wild, manager, Kansas City, Missouri.

Calorizing Co., Pittsburgh.
Samples showing effects of oxidation on plain steel tubing and calorized tubing.
A. V. Farr, vice-president, New York.
E. W. Long, western sales manager, Kansas City.
A. M. Risdon, district sales manager, Houston.
J. F. Isaacs, district sales manager, Kansas City.

Champion Pneumatic Machinery Co., Chicago.
Air compressors.
H. H. Kouka, sales manager, Chicago.
Leo Spalding, manager, Tulsa.

Where the heavy batteries were in action—Gas and oil engines, tractors and oil field power generally

Crouse Clear Vision Pump Co., Wichita, Kansas.
Filling station equipment.
Leo Spalding, manager, Tulsa.
Emery Crouse, president, Wichita.
Joseph O'Leary, sales manager, Wichita.

Clear Vision Sales Co., Tulsa.
Visible gasoline pumps, Gardner air compressors.
O. B. Lemmon, president and general manager, Tulsa.
J. J. Henderson, vice-president, Tulsa.

Clark Machine Co., Wichita Falls, Texas.
Clark clean-out machine.
H. A. Clark, manager, Wichita Falls.

Connolly, D. F. Agency, Inc., Tulsa.
F & T 45 H. P. code boiler.
D. F. Connolly, president, Tulsa.
F. P. Monahan, secretary-treasurer, Tulsa.

C. & G. Cooper Co., Mount Vernon, Ohio.
80 H. P. 4 cycle gas engine with 28-inch vacuum cylinder.
F. H. Thomas, vice-president, Mount Vernon.
W. C. Kobel, Mid-Continent service engineer, Tulsa.
F. M. Devin, manager, Dallas.
T. F. Hudgens, manager, Tulsa.

Crowell Packer Co., Tulsa.
Control head packers, oil savers, landing heads.
Hugh E. Robinson, manager, Tulsa.
W. H. Lynch, salesman, Tulsa.
S. P. Tschoppat, salesman, Tulsa.

Clark Bros Co., Olean, N. Y.
80 H. P. Clark compressor and Clark "Junior" drilling engine.
C. P. Clark, secretary, Olean.
William F. Cummings, sales engineer, Tulsa.
O. B. Agner, sales engineer, Pittsburgh.

Clifford Mfg. Co., Tulsa.
Lubricated differential vapor valves.
Victor Clifford, Presidnt, Tulsa.
W. M. Criner, vice-president, Tulsa.

Deck Clamp Tank Co., Okmulgee, Okla.
Deck clamp tanks.
Charles B. Johnson, sales department, Tulsa.
J. J. Deering, field superintendent, Bristow, Okla.
C. H. Bixler, field superintendent, Tulsa.

Dawes Electric Sign & Manufacturing Co., Pittsburgh.
Sign and lighting globes, lighting posts, brackets, etc.
Q. P. Stahlman, sales manager, Pittsburg.

DeLaval Separator Co., New York.
Centrifugal oil purifiers.
Paul S. Reed, Tulsa Representative.

Empire Natural Gas Co., Bartlesville, Okla.
Natural Gas Distribution.
H. D. Holman, engineer, Bartlesville.
O. B. Seyster, public relations, Bartlesville, Okla.
C. H. Koimn, engineer, Winfield, Kansas.

Eagle Picher Lead Co., Joplin, Mo.
Lead, lead products, wool lead, white lead, babbitts, solder.
F. W. C. Bailey, salesman, Joplin.
I. A. Wright, salesman, Oklahoma City.

Eastern Torpedo of Ohio Company, Toledo, Ohio.
Nitroglycerine wagons.
D. A. Koons, general manager, Tulsa.
W .H. Swartz, assistant manager, Tulsa.
Willis Hill, Shooter, Tulsa.
F. C. Harris, Shooter, Tulsa

Emery B. V. & Co., Tulsa.
Pumps, powers, D. & B. working barrels and fittings.
B. V. Emery, president, Tulsa.
P. M. Castainin, vice president, Sapulpa, Okla.
F. E. Steele, salesman, Houston.
Perry McAnnich, Dallas.
R. T. Rogers, Kansas City.

Floridin Company, Warren, Pa.
Floridin process filtering and bleaching oils.
W. L. Macgowan, vice-president and General manager, Quincy, Fla.
Allen C. Jackson, Secretary and treasurer, Warren.
Robert C. Wallace, Chemist, Quincy.

Foster, Dean E., Tulsa.
Foster baffle for absorbers.
D. E. Foster, consulting engineer, Tulsa.
John S. Blair, engineer, Tulsa.

Foamite Childe Corp., Utica.
Foamite fire extinguishing systems and apparatus for oil tanks, refineries and leases.
H. P. Maginniss, Oklahoma representative, Tulsa.
W. G. Grant, Oklahoma representative, Tulsa.
A. E. Canaday, division manager, Kansas City, Mo.

Foxboro Co. Inc., Foxboro, Mass.
Orifice meters, recording thermometers, pressure gauges.
Willis C. Brown, district manager, Tulsa.
A. J. Kerr, sales engineer, Tulsa.

Freeborn, F. W., Engineering Corp., Tulsa.
Valuation and Appraisal reports.
T. P. Moote, engineer, Tulsa.
Joseph H. Cable, engineer, Tulsa.
F. S. Julius, engineer, Tulsa.
H. L. DeBar, Tulsa.

Frick-Reid Supply Co., Pittsburgh
Reid engines, National Transit pumps, Beaumont rotaries, Axelson prod. Valves, Reid powers, belting and general supplies.
W. E. Frick, president, Pittsburg.
J. E. Shakely, sales manager, Tulsa.
S. F. Swindler, vice-president, Tulsa.

Gas Tite Device Co., Pawhuska, Okla.
Gas tight devices.
T. H. Boyd, superintendent, Pawhuska.
W. G. Kiser, sales manager, Pawhuska.

Gaso Pump & Burner Manufacturing Co., Tulsa.
High pressure pipe line pumps.
H. F. Stover, assistant treasurer, Tulsa.
J. E. Winger, manager foundry, Tulsa.
L. D. Armstrong, treasurer, Tulsa.

Goodyear Tire & Rubber Co., Akron, Ohio.
Oil field belting, steam hose, rotary hose and water hose.
W. J. Brunk, salesman, Tulsa.

Guiberson Company, Los Angeles.
Guiberson tubing catcher, swabs, bottom plugs, tongs, unfereeam ers.
A. B. Stilwell, district manager, Tulsa.
R. S. Haseltine, general manager, Dallas.
W. R. Guiberson, vice-president, Los Angeles.
N. G. Guiberson, treasurer, Dallas.

Graver Corporation, East Chicago, Ind.

Tanks, refinery equipment and water softeners.

J. P. Graver, president, Chicago.
J. E. Swanson, district manager, Houston.
C. L. Marner, district-sales manager, Tulsa.
F. W. Miller, general superintendent, East Chicago.

Gasoline Products Co., Kansas City.

Cross cracking process.

Dr. W. M. Cross, vice-president, Kansas City.
Dr. Roy Cross, Kansas City
H. E. Widdell, engineer.
G. H. Clay, Salesman.

Graham Brothers, Detroit.

Trucks.

S. B. Robertson, district representative, Kansas City, Mo.
Norval and Dial, local Dealers, Tulsa.

Gustin Bacon Manufacturing Co., Kansas City.

Oil field belting, packing, hose, mechanical rubber goods, tires.

N. M. Grove, branch manager, Tulsa.
E. K. Goetze, treasurer, Kansas City.
M. D. Duval, tire department representative, Tulsa.

Gilbert & Barker Mfg. Co., Springfield, Mass.

Measuring and non-measuring pumps and storage tanks for gasoline and other liquids.

S. C. Klein, St. Louis.
L. C. Ferguson, Chicago.

Hinderliter Tool Co., Tulsa.

Hinderliter kick-off tools, combination sockets, tool hooks, joint breakers, jar up and jar down casing ripper.

Herman B. Hendershot, secretary and sales manager, Tulsa.
Robert I. Watkins, salesman, Bristow, Okla.
H. M. Crolty, salesman, Tulsa.

Highland Body Mfg. Co., Cincinnati.

Driver cabs for motor trucks.

Samuel Froume, traveling salesmanager, Cincinnati.

Hill Hubbell & Co., San Francisco.

Technical paints, biturine solution and enamel for steel and pipe line protec. Tank paints.

E. A. Guenther, salesman, San Francisco.

Hope Engineering & Supply Co., Mount Vernon, Ohio.

Reeves vertical gas engines, vertical comb'n gas engine driven compressor heat exchangers and gasplant equipment, Hope biplane Compressor valves.

R. J. Lindsay, vice-president, Mount Vernon.
D. W. McKay, Western representative, Tulsa.
E. N. Layfield, superintendent construction, Mount Vernon.

Harrisburg P. and P. Bending Co. of Texas
Goddard Thomas Mfg. Co., Tulsa.

International Derrick Equipment Co., Columbus, Ohio.

Derricks, bull wheels, band wheels, calf wheels, tug rims, walking beams, pitmans, crown blocks, sheaves and bearings.

F. U. Mohler, manager, Tulsa.
R. R. Bloss, manager of production and engineer, Columbus.
R. W. Henry, district manager, Tulsa.
R. J. Mitchell, office manager, Tulsa.

International Supply Co., Tulsa.

Oil field supplies.

R. S. McKeever, sales manager, Tulsa.
C. Shupert, assistant sales manager, Tulsa.

Jones, S. M. Company, Toledo, Ohio.

Jones's Acme sucker rods, MacDonell sucker rod pulling machine, Brady guides.

P. C. Jones, president, Toledo.
A. L. Meeks, manager, Tulsa.

Key Boiler Equipment Co., East St. Louis, Ill.

Key hot joint paste, Junction boxes for oil crecking stills, hand hole plates for boilers and super-heaters, heavy steel stampings of all descriptions.

Fred Key, vice president, East St. Louis.
F. A. Post, representative, Houston.
Western Supply Co., Tulsa, agents.

Keystone Lubricating Co., St. Louis.

Keystone grease and lubricating devices.

J. H. Elgin, agent, Tulsa.
J. H. Yerkes, sales manager, St. Louis.

King Engineering Co., Tulsa.

King Hydro-Carbon Motor.

W. S. King, manager, Tulsa.

Longhart Supply Co. Fort Worth.

F. & T. Boiler, Hazard wire lines.

L. A. Eberhart, secretary, Fort Worth.

Leader Iron Works, Decatur, Ill.

Leader rivet weld station tanks and refinery equipment.

E. R. Kyler, assistant to president, Decatur.
C. B. Irish, manager, St. Louis.
R. F. Doepel, sales engineer, Decatur.

Landis Machine Co., Waynesboro, Pa.

Landis pipe threading and cutting machinery.

C. N. Kirkpatrick, sales manager, Waynesboro.
H. W. Marker, Waynesboro.

Midwest Building Material Co.

Nokol automatic oil burner. Meuller furnace.

R. A. Brown, state manager, Oklahoma City, Okla.
C. L. Wallery, sales manager, Oklahoma City.

*—See pages 32—P for H—additional.

Mine Safety Appliances Co., Pittsburgh, Pa.

Devices for detecting poisonous gases, masks and oxygen apparatus,, resuscitation devices.

E. H. Kellogg, assistant sales manager, Pittsburg.
J. R. Fleming, Safety Engineer, St. Louis.

Midwest Piping & Supply Co., St. Louis.

Pipe bends, coils, flange joints, headers

J. M. Moffett, secretary, St. Louis.
G. L. Morrill, Manager engineer sales.

McSavaney Co., Springfield, Ohio.

Electric signs and pump globes.

J. A. Cadle, manager, Springfield.
H. S. McSavaney, president, Springfield.
G. N. Keith, salesman, Oklahoma City.

Moore, Lee C. & Company, Inc., Pittsburg, Pa.

Manufacturers steel pipe drilling and pumping derricks. Dealers in all-stee pipe drilling and pumping derricks.

C. R. Krause, western manager, Tulsa.
Lee C. Moore, president, Tulsa.
W. D. Reese, eastern manager, Pittsburg.
W. P. Payne, district manager, Dallas.
M. R. Gayle, district manager, Shreveport, La.

McDonald, A. Y. Mfg. Co., Dubuque, Ia.

Swing joints, tank vents, universal gastite dome covers, valves and fittings.

C. L. Reeder, manager oil equipment dept., Dubuque.
C. W. Jackson, sales engineer, Dubuque.

McEvoy, J. H. Co., Houston.

Wireless well strainers and accessories.

J. H. McEvoy, General Manager.

Missouri Paint & Varnish Co., St. Louis.

Portland—cem-cote, sealaleak.

Park D. Cole, district manager, Oklahoma City, Okla.
R. H. Swearingen, local representative, Tulsa.

Metal Barrel Corporation, Peoria, Ill.

Steel Barrels and Underground tanks.

Otto J. Best, sales manager, Tulsa.
Wm. A. Schlueter, district sales manager,, Tulsa.
Sherman G. Long, general manager, Peoria.

Meriam Co., Cleveland, Ohio.

Manometers, draft gauges, flow meters.

J. B. Meriam, president, Cleveland.
O. J. Best, manager, Refinery Supply Co., Tulsa.
W. A. Schlueter, president, Refinery Supply Co., Tulsa.

Morrison Bros., Dubuque, Ia.

Equipment for handling oil from oil field to automobile, new bulk station pump.

A. L. Morrison, secretary, Dubuque.
R. H. Cox, salesman, Dubuque.
J. C. Walker, director of sales, Dubuque.

Magneto Ignition Co., Inc., Tulsa.

Magnetos, ignition supplies.

O. R. Wahlauf, president, Tulsa.
R. E. Day, manager, Tulsa.
W. S. Barnes, salesman, Tulsa.

Mattison and Davey, New York.

Accounting and engineering service.

Chas. D. Smith, resident manager, Tulsa.
J. R. Klumpp, engineer, Tulsa.

Mason Mfg. Co., Tulsa.

Mason measure meter. Wire line shock absorber. Temper screw lift.

R. C. Mason, president, Tulsa.
J. D. Freeman, secretary, Tulsa.
George E. Summers, sales manager, Tulsa.

National Carbon Co., Inc., Kansas City Branch.

Flashlights, Dry batteries, Radio batteries, Automatic brushes.

F. E. Cory, salesman, Kansas City.
M. C. Spann, salesman, Kansas City.

National Tube Company, Pittsburg.

Oil country tubular goods and line pipe.

W. L. Schaeffer, advertising manager, Pittsburg.
J. B. Garham, Pittsburg.
C. W. Kennedy, St. Louis.
F. R. Braman, Sapulpa.
J. H. Greer, St. Louis.
J. L. Smith, Pittsburgh.

National Car Seal Co., Hamilton, Ohio.

Visible lubricating oil pumps.

E. Hobbs, state manager, Oklahoma City.

National Meter Co., New York.

Meters for measuring oils of various kinds and under various conditions.

John E. Hosier, assistant manager, Chicago.
Geo. D. MacVeagh, engineer, New York.

National Supply Companies, Toledo, Ohio.

General Oil Field Supplies.

Ira G. Witherill, division manager, Independence, Kans.
W. E. Messenger, assistant manager, Independence.
O. T. Dawson, general district manager, Tulsa.
Hugh Trimble, sales manager, Toledo.

Ohio Machinery Tool Co., Kenton, Ohio.

Shop machinery.

C. C. Swift, manager, Kenton.
L. H. Peters, superintendent, Kenton.
R. E. McArdle, representative, New Orleans.
Joe Hanning, St. Louis.

O'Bannon Co., Walter, Tulsa.
Sucker rod guides, elevators, hooks, sockets and rotary pumps.
Walter O'Bannon, Manager.
Robert Oldham, Salesman.

Rand, McNally & Company, Chicago.
Official auto trails maps and filling station coupon books.
Thos. J. Hayden, manager ticket department, Chicago.
Chas. E. Carlson, representative, Chicago.
Geo. Lochridge, district manager, Dallas.

Oklahoma Natural Gas Co., Tulsa.
Natural gas distributor.
A. W. Leonard, vice-president, Tulsa.
N. A. Newton, manager service department.
R. W. Hendee, assistant superintendent gas measurement.
A. W. Proctor, assistant manager service department, Tulsa.

Oklahoma Steel Castings Co., Tulsa.
Steel castings for oil industry, tank car castings, crank shafts and castings for commercial purposes.
Earnest H. Cornelius, president, Tulsa.
J. R. Johnston, superintendent, Tulsa.

Oil Well Supply Co., Pittsubrg.
General oil well supplies.
E. E. Greeve, mechanical engineer, Pittsburg.
Byron Post, sales manager, Tulsa.
George A. Gage, in charge booth, Tulsa.
John Post, district manager, Shreveport.
S. Clark Reed, vice-president, Pittsburg.

Oklahoma Iron Works, Tulsa.
Drilling bits, drilling and fishing jars and O.K. combination casing spears.
A. F. Bourne, secretary and treasurer, Tulsa.
William Wright, superintendent, Tulsa.
John W. Sloan, Jr., sales manager, Tulsa.
W. D. Taylor, salesman, Tulsa.

Oil Conservation Engineering Co., Cleveland, Ohio.
Conservation vent valves, flame arrestors, oil still safety valves, automatic tar plugs.
S. H. Brooks, president, Cleveland.
J. A. Stough, manager, Mid-Continent district, Tulsa.
R. Greve, representative, Los Angeles.

Oxweld Acetylene Co., Newark, N. J.
Oxy-Actylene welding and cutting, the oxweld process of welding and cutting metals.
C. E. Ziesel, assistant sales manager, Chicago.
L. B. Moon, district representative, Tulsa.
Z. Davis, publicity manager, New York.
H. Hamilton, service operator, Chicago.

Oil Well Improvements Co., Tulsa.
Control casing heads and roller oil savers. Improved straight line casing hds.
E. W. Wright, secretary and treasurer, Tulsa.
J. L. Gray, representative, Tulsa.
W. Hellewell, foreman, Collinsville, Okla.

Parkersburg Rig and Reel Co., Parkersburg, W. Va.
Chain drivers sand reel, Rig irons, steel Pitman, steel crane block lease lands.
J. W. Crawford, president, Parkersburg.
H. J. Lockhart, vice-president, Parkersburg.
A. V. Wadsworth, production supertintendent, Parkersburg.
D. F. McCarty, district manager, Tulsa.
L. G. E. Bignell, sales engineer, Tulsa.

Palmer Specialty Co., Tulsa.
Palmer control head.
B. F. Palmer, president, Tulsa.
B. F. King, salesman, Tulsa.
J. W. Salles, sales manager, Tulsa.

Philip Carey Co., Cincinnati, Ohio.
Heat insulation, roofing, shingles, waterproofing, paints and asbestos special.
L. E. Whitaker, manager, Oil Industries Co., Cincinnati.
W. E. Catlett, representative, Tulsa.
J. C. Rector, manager prepared roofing department, Cincinnati.

Powell, William Co., Cincinnati.
White Star globes, gates, angle and check valves, lubricator, oilers.
R. D. Allen, sales manager, Cincinnati.
Charles Cullen, salesman, Cincinnati, Ohio.

Pyle National Co., Chicago.
Generators and flood lights.
C. T. Tewkesbury, Tulsa.
A. E. Johnson, Chicago.
R. L. Kilker, Kansas City.

Pratt & Whitney Co., Hartford, Conn.
Tools and gauges.
C. L. Goodrich, assistant superintendent, Hartford.
B. H. Blood, general manager, Hartford.
Major Buckingham, engineer, Hartford.

Producers & Refiners Corp., Chicago.
Oil products.
C. A. Easton, assistant treasurer, Tulsa.
G. T. Granger, refinery technologist, Tulsa.
D. C. Wixson, assistant sales manager, Tulsa.

Power Engineering & Ignition Co., Tulsa.
Apollo magnetos for gas engines, Wico igniters, steam turbines, generators, lubricators.
M. C. Elworthy, president and manager, Tulsa.
E. A. Grigoleit, vice-president and service manager, Tulsa.

Progressive Brass Manufacturing Co., Kansas City.
Standard oil field brass goods.
E. J. Thomas, president, Kansas City.
A. N. Porter, Tulsa.

Petroleum Safety Appliance Co., Tulsa.
Liquid seal safety valves and thief hole device.
W. E. O'Meilia, sales manager, Tulsa.
S. C. Clover, president, Tulsa.
M. K. Clover, vice-president, St. Marys.

Reed Roller Bit Co., Houston.
Roller rock bits and core barrels.
E. A. Reed, salesman, Houston.
Guy O. Danielson, salesman, Houston.

Republic Supply Co., Tulsa.
Gumbo Buster rotaries, Standard seamless upset rotary drill pipe. Wall cables and bull ropes, Powell valves, Republic pipe.
J. H. Brooks, district manager, Tulsa.
B. C. McMullen, city salesman, Tulsa.

Refinery Supply Co., Tulsa.
Refinery and laboratory equipment.
O. J. Best, manager, Tulsa.
W. A. Schlueter, president, Tulsa.

Robinson Packer Co., Tulsa.
Fisher swab, tool cutting cave packer, Bruce automatic gas drip. Three-in-one gas packers. Limit plug and general line.
W. G. Long, treasurer, Tulsa.
H. L. King, sales manager, Coffeyville, Kansas.
Miles Wertz, store manager, Tulsa.

Rock Island Plow Co., Rock Island, Ill.
Heider tractor hoist, Rock Island pumping unit.
Lon R. Stansbury, Tulsa representative.
A. H. Gillbert, chief engineer, Rock Island.
L. F. Cannon, trade manager, Rock Island.
H. O. Bird, factory representative, Tulsa.
J. B. Fisher, motor designer, Wawkasha, Wis.

R—F Electrical Mfg. Co., Augusta, Kansas.
Frost "Vertical" turbine generators.
John L. Baker, Oklahoma representative, Tulsa.
George F. Williams, factory superintendent, Augusta.

Roots, P. H. & F. M. Company, Connesville, Ind.
Rotary gas pumps, rotary oil and water pumps oil and gas meters, Hot oil pumps.
W. L. Sexlon, sales engineer, Connersville.
W. Woobank, sales representative, Tulsa.

Ryerson, Joseph T. & Son, Chicago.
Lathes and pipe machines.
F. J. Clark, salesman, Chicago.

Sullivan Machinery Co., Chicago.
Diamond core drills and equipment.
H. T. Walsh, general sales manager, Chicago.
J. S. Mitchell, drill department, Chicago.
D. H. Hunter, district manager, Dallas.
George E. Failing, State agent, Garber, Okla.

Swartwout Co., Cleveland.
Swartwout metal buildings, Swartwout rotary ball bearing ventilators.
H. T. Rilley, district manager, Dallas.
E. H. Morgan, distributor, Tulsa.
L. P. Russon, assistant general sales manager, Cleveland.

Southern Mill & Manufacturing Co., Tulsa.
Sectional lease houses.
W. H. Ahrens, president, Tulsa.
J. P. Francisco, superintendent, Tulsa.
C. H. Ahrens, manager house department, Tulsa.

Southwest General Electric Co., Tulsa.
Oil well motors, pumping and drilling and switching equipment, lighting generators, arc welding machines, flood lights and searchlights.
D. V. Gaston, sales agent, Tulsa.
D. L. Cramb, operator, Schenectady.
A. L. Jones, sales agent, Oklahoma City.

Superior Tube Co., Kansas City.
Oil country pipe, steel derricks, seamless steel couplings.
Hoyle Jones, president, Kansas City.
J. D. Holloway, vice president, Pittsburgh.
Harboar Mitchell, manager derrick division, Pittsburg.
James A. Thomas, assistant manager, Tulsa.
E. J. Nordstrom, Dallas.

Sun Oil Company, Philadelphia.
Sun oils and greases, Sunoco motor oil and greases.
A. M. Ballard, district manager, Tulsa.
K. W. Cunningham, special representative, Tulsa.
C. A. Calongne, motor oil representative, Tulsa.

Standard Machine and Tool Co., Bristow.
Underreamers and hinged tool liners.
J. E. Morgan, vice-president, Bristow.
J. R. McCoy, president, Bristow.

Skinner, M. B. Co., Chicago.
Pipe repair clamps and saddles.
M. B. Skinner, president, Chicago.
F. A. McMurray, representative, Tulsa.
F. R. McMurray, representative, Los Angeles.

Shaffer Specialty Co., Tulsa.
Shaffer all metal sand reel support, Shaffer sucker rod sockets, Angus safety casing clamps.
E. J. Shaffer, president, Tulsa.
George W. Shaffer, secretary and treasurer, Tulsa.
Harry F. Hinish, sales, Tulsa.

Smith Separator Company, Inc., Tulsa.
Oil and gas separators.
M. F. Waters, manager, Tulsa.
J. A. Morgan, salesman, Tulsa.

Standard Tank Car Co., St. Louis.

Tank cars and parts.

Frank Thompson, Southwestern representative, Tulsa.
F. A. Singler, sales manager, St. Louis.
J. R. Sweeney, traffic manager, St. Louis.

Sinclair Refining Co., Chicago.

Oil products.

Stanley D. White, assistant chief chemist, Chicago.
J. L. Harp, sales representative, Okla. City.
J. M. Bellamy, sales representative, Tulsa.

Silumite Products Corp., Philadelphia.

Silumite paint products.

D. V. Ault, president, Philadelphia.
O. J. Best, general manager Refinery Supply Co., Tulsa.
W. H. Schlenter, president Refinery Supply Co., Tulsa.

S. K. F. Industries Inc., New York City.

Ball and roller bearings.

H. L. Gaddis, engineer, Dallas, Texas.

Triangle Blue Print & Supply Co., Tulsa.

Oil field maps, geologists' instruments, surveying instruments, drafting instruments, steel shelving and bank equipment.

H. W. Lindy, secretary-treasurer, Tulsa.
L. C. Birchfield, president, Tulsa.
W. L. Bailey, city salesman, Tulsa.

Truscon Steel Company, Youngstown, Ohio.

Standard steel buildings, steel doors, steel sash, Metal lath, Kahn bars, inserts, basement sash, floor tile.

W. K. Sparks, Southern representative, Mobile, Ala.
W. L. Quigley, special representative, Youngstown.
W. E. Moore, local manager, Tulsa.

Templeton Kenly & Co., Ltd., Chicago.

Simplex jacks for oil country service.

H. B. Burlow, manager jobbing sales, Chicago.

Twin Packer Oil and Gas Company, Pittsburg.

Agitator for cleaning out oil and gas wells, twin packers, pat. packers on liners

J. A. Knox, vice-president, Pittsburg.
T. H. Gallagher, president, Pittsburg.

Trimont Mfg. Co., Boston, Mass.

Trimo pipe wrenches, monkey wrenches, pipe cutters, chain wrenches.

H. H. Wotherspoon, special representative, Roxbury, Boston.

Transit Pump & Engine Co., Tulsa.

Bear tractors, Anderson oil engines, sizer electric steel for oil well tools, spiral stems.

L. S. Allen, Tulsa.
George P. Wisdom, Tulsa.
S. M. Williams, Jr., Tulsa.

Tulsa Rig, Reel and Mfg. Co., Tulsa.

American steel derricks, Twin City tractor hoists, Doreco drilling boiler gas burners, American steel replacement bull wheels, American steel pony wheels.

Walker S. Estes, general manager, Tulsa.
A. Lea Keltner, manager, tractor department, Tulsa.
F. A. Funk, Chief engineer, Tulsa.

Texas Company, Houston.

General oil products.

R. G. Johnson, special agent, Tulsa.
J. W. Wallace, agent, Tulsa.

Tagliabue Manufacturing Co., Brooklyn.

Oil testing instruments, Mono air recorder for natural gases.

W. A. Schlueter, assistant manager, Tulsa.
F. D. Harger, manager, Mono department, Brooklyn.

Union Machine Co., Bartlesville.

Durnell underpull pumping powers.

H. G. Durnell, vice-president, Bartlesville.
S. T. Steel, secretary-treasurer, Bartlesville.
L. A. Steel, superintendent, Bartlesville.
Claude Ross, mechanic, Bartlesville.

Universal Oil Products Co., Chicago.

Dubbs Cracking process.

C. P. Dubbs, inventor, Chicago.
W. R. Howard, Washington.
S. Olsen, Brooklyn.
M. J. Bogardus, sales manager, Chicago.
A. R. Chandler, representative, Los Angeles.
G. R. Simons, chief salesman, Kansas and Oklahoma.
C. J. Pratt, chief salesman, Texas.

United Lead Company, New York.

Sludge acid concentrator, Simonson-Mantius vacuum process.

Otto Mantius, consulting engineer, New York.

Vogt Henry Machine Co., Louisville, Ky.

Drop forged steel valves and fittings for high pressures and temperatures. Manufacturers wax presses, oil chillers, boilers.

W. S. Cannon, Jr., salesman, Louisville, Ky.

Victory Mfg. Co., Niles, California.

Victory double packed stop-cock valves, particularly for petroleum refinery service, hot oils, acids, etc.

E. E. Matheson, factory engineer, Niles California.
O. Kelly, district representative, Wichita Falls, Texas.

Victor Balata and Textile Belting Co., Tulsa.

Petrol belt and balata belt.

W. H. Portong, special representative, Tulsa.

Wichita Pump and Equipment Co., Wichita, Kansas.

Gasoline dispensers.

J. C. Riggs, manager, Wichita.

Wilson Welder & Metals Co., New York.

Gasolene driven, electric welding machinery.

Harold C. Price, Oklahoma representative, Bartlesville.
W. M. Bastable, sales manager, New York City.

Williamsport Wire Rope Co., Williamsport, Pa.

Wire rope, petrol belting, Lubri cup valve cups and Wall rope.

H. R. Gruber, general manager, Tulsa.
V. S. Tilden, salesman, Tulsa.

White Motor Company, Cleveland.

Motor trucks.

Saunders Jones, vice-president, St. Louis.
J. D. Allen, district manager, Kansas City.
Eugene Kelly, district manager, St. Louis.
Pat E. O'Connor, manager, petroleum division, Cleveland.

Wheeling Steel Corp., Wheeling, W. Va.

Line pipe, galvanized and black sheets, plates, cut and wire nails, wire products, steel barrels, casing and oil country goods.

W. E. Himes, Wheeling.
E. B. Pentz, Kansas City.
H. E. Schaefer, Wheeling.
A. J. Fitzgibben, Wheeling.
S. W. B. Wood, Kansas City.

Worthington, A. P. Co., Los Angeles, California.

Pumping grips and hangers.

C. R. Irwin, salesman, Los Angeles.

Westinghouse Electric & Mfg. Co., Pittsburg.

Oil well pumping and drilling motors, arc welding equipment, steam turbine generators for rig lighting.

C. S. Carter, Tulsa representative.
Paul Orr, special representative from East Pittsburg Works.

Western Supply Co., Tulsa.

Three-jaw wire line clamps, Clulow pump tubing socket, Hardenburg underreamer, Worthington pumps.

F. E. Crotto, Tulsa.
J. H. Feemster, Tulsa.

Whitney, E. L. Co., Tulsa.

Steel derricks, Hazard wire lines.
C. R. Pigott, general sales manager, Tulsa.
A. H. Jameson, engineer, Topeka, Kansas.
Clark Boyer, agent, Shreveport.
Howard Hannah, agent, Topeka.
Harry Troutman, agent, Tulsa.
Clyde Duvall, agent, Henryetta, Okla.
Bert Keele, agent, Los Angeles.
E. L. Whitney, agnet, Tulsa.
W. S. Hart, agent, Caspoer.

Westcott & Greis, Tulsa.

Metric Metal Works, Meters, Westcott Valve Co. Valves.
J. H. Satterwhite, manager, Tulsa.
Harold Wahl, salesman, Dallas.
E. V. Zull, salesman, Shreveport.
A. J. McEwan, sales manager, Tulsa.

W-K-M Co., Inc., Houston.

Rotary slips, tool joints, standing valves, spears, "Set fast" rod hanger. Hill Krohn tongs.

L. O. Koen, vice-president, Houston.
J. D. Nixon, salesman, Houston.
G. C. Ross, salesman, Corsicana, Texas.
J. W. Gillaspie, salesman, Smackvoer.
C. E. Campbell, salesman, Houston.
Bert L. Ligon, salesman, Electra.

Walworth Mfg. Co., Boston.

Walworth valves and fittings, Kewanee unions and Stillson wrenches.

C. W. Watson, manager of sales, Kewanee, Ill.
W. C. Goza, assistant manager of sales, Kewanee.
Julius Schoekel, salesman, St. Louis.
D. F. Moran, salesman, Houston.

Williams Tool Corp., Erie, Pa.

Pipe threading machines.
Leslie H. Taylor, sales manager, Erie, Pa.

Young, W. T., Engine Co., Cleveland.

Drilling engines.

W. A. Scott, sales and service, Cleveland.

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Hudson Wire & Iron Co., Tulsa.

Fencing, gates and steel posts.
Page E. Hudson, owner, Tulsa.
W. B. Hudson, owner, Tulsa.

Hughes Tool Co., Houston.

Rotary Rock bits, tool joints and disc bits.
S. P. Brown, sales manager, Houston.
W. C. Morgan, representative, Tulsa.

Hough, Charles N. Mfg. Co., Franklin, Pa.

Seamless steel working barrels, steel and bronze balls and seats, pumping equipment and specialities.

O. J. Thompson, general manager, Franklin.
R. H. Lee, sales representative, Oil City, Pa.

Hill Clutch Co., Cleveland.

Smith type hill friction clutch and Hill collar oiling bearings.
Hunter Morrison, sales manager, Cleveland.

Hopkins Motor Co., Tulsa.

International trucks and tractors. Bay City oil field truck and tractor wrench.

L. V. Hopkins, general manager, Tulsa.
S. A. Bodine, factory manager., Tulsa.
C. E. Blaker, factory manager, Parsons, Kans.

Halliburton, Erle P., Duncan, Okla.

Oil well cementing.

Ted Gilbert, Duncan,
Erle Halliburton, Duncan.

Harrisburg Pipe and Pipe Bending Co., Harrisburg, Pa.

Seamless steel couplings, steel products.

Close up of Wheeler Ridge oil field, showing road construction. Discovery well down slope at left.

Big Difficulties Conquerd Here

By Paul Wagner

STAFF REPRESENTATIVE

BAKERSFIELD, CAL., Oct. 10 THAT part of the foothill belt which fringes the south end of the San Joaquin Valley constitutes the scene of current attempts to develop under obstacles an important new oil producing area in California.

Five producing wells at Wheeler Ridge, in southern Kern county, constitute the sum total to date of Nature's recompense for man's endeavor. These five wells, drilled after an expenditure of hundreds of thousands of dollars, are producing currently a total of approximately 620 barrels daily.

Further eastward, some 10 miles or more away, at Comanche Point, less success has been encountered by the Globe Petroleum Co., drilling No. 1 Teion Sec. 32-12N-18W, San Bernardino Base and Meridian, it encountering only a four-barrel show at 1633 feet.

The Wheeler Ridge wells, developed by the Standard Oil Co. (California) are in Sec. 28-11N-20W, and generally produce from the approximate level of 2100 feet. No. 1 in that section, the discovery well, came in originally for about 270 barrels and at its present daily production of 200 barrels is within 10 barrels of its worth last spring. No. 2, drilled as a deep test and completed in what is probably a sand lens in the lower shales, got a flow of 120 barrels daily around 3400 feet; but having declined to 29 barrels, Sept. 30, it probably will be deepened. Nos. 3, 4 and 5 are averaging about 130 barrels daily, each.

Higher on the structure at Wheeler Ridge, the General Petroleum Corp., which owns a quarter section adjacent to the Standard's wells, is making water shut-off above the oil sand, which is soon to be tested. A test of the McAdoo interests, located lower on the structure, also is attempting water shutoff before drilling in. Upon these adjacent tests, especially that of the General Petroleum, will depend additional information about California's newest oil field.

It is apparent to the Standard interests that Wheeler Ridge will not prove as important a field as originally anticipated, but the 400 acres of proven ground credited to the development by the California State Mining Bureau engineers undoubtedly will be extended and it is probable that operations will eventually assume much more important scope than currently visible results would indicate.

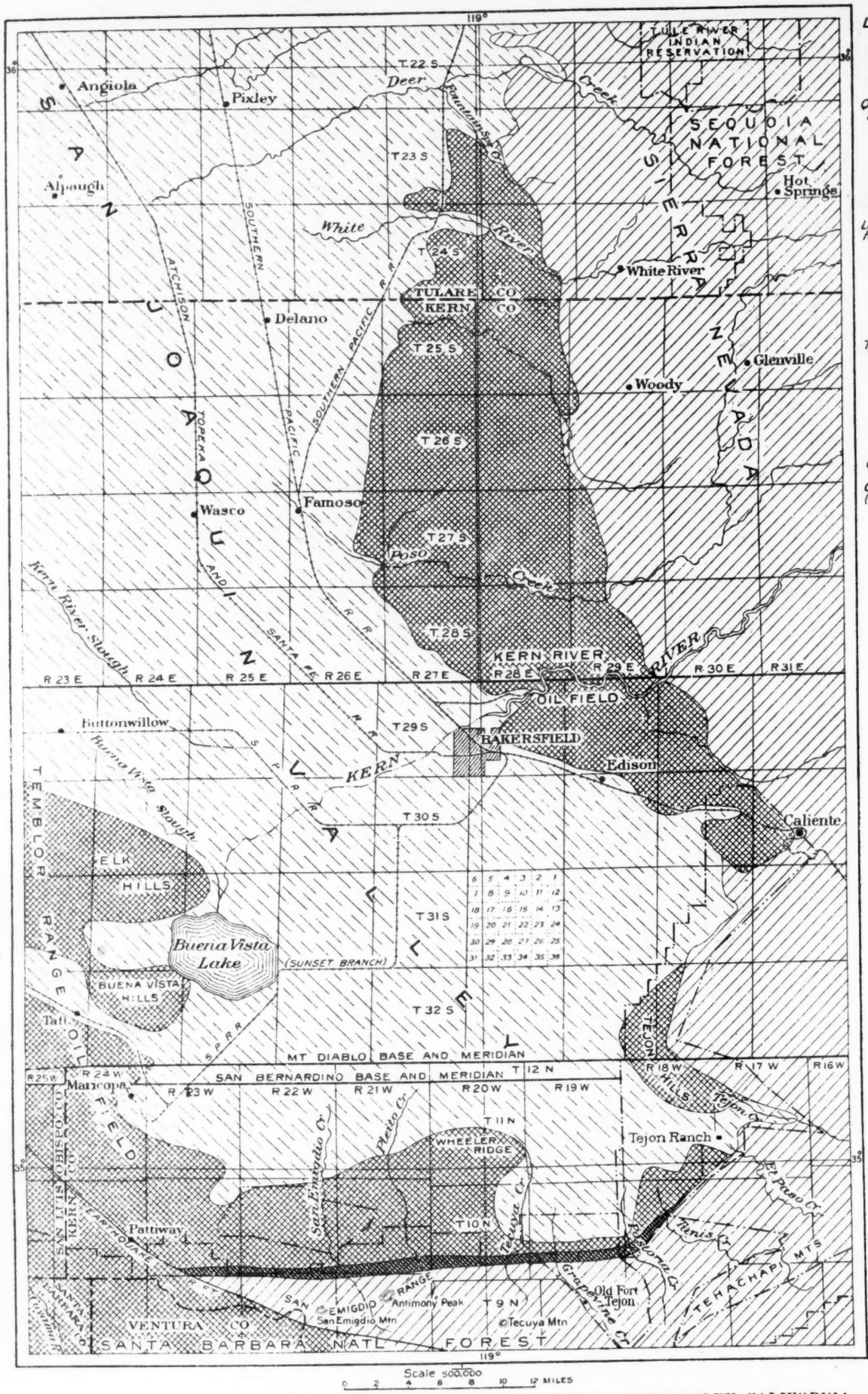
The presence of oil bearing strata and the occurrence of favorable geologic structure to make possible the accumulation of commercial petroleum have been long recognized at Wheeler Ridge. Robert Anderson, in Bulletin 471 of the United States Geological Survey, referred to such a structure, "to be found in Wheeler Ridge which extends into the valley east of Plieto Creek."

Another promising area described by Anderson lies farther west "along the edge of the valley north of the mouths of Muddy and Santiago Creeks, and northwest of the mouth of San Emigdio Creek". This latter area he described as bidding "fair to form an eastward extension of the Sunset field", but he held that it did not appear likely to be continuous with the then prospective Wheeler Ridge field.

Maricopa Flats Extension

An interesting current development in connection with this forecast, which dates back to 1921, is the completion at 3910 feet of a 1715 barrel well of the Transport Oil Co., in the southeast half of 4-11N-23W, extending production southeasterly in this direction from the old Maricopa Flats part of the Sunset-Midway development. The well, which shows 415 pounds pressure, tends to indicate a considerable extension of the Maricopa flats area, confirming a more gradual dip than operators had anticipated.

The Transport well, No. 1 Bush, is described as probably producing from the lower Etchegoin formation, which overlies unconformably the Monterey (diatomaceous) shales in this region. Ordinarily production in the Sunset-Midway region comes from levels higher in the Etchegoin and not neces-



RECONNAISSANCE MAP OF THE SOUTHERN END OF THE SAN JOAQUIN VALLEY, CALIFORNIA

sarily from the base of the formation, as appears probable in this case.

The Calitrolium Oil & Gas Co., from which the Transport acquired its leasehold, owns the remaining three-fourths of the southeast 160 acres in 4-11N-23W and its well in the northwest corner of the southeast quarter is the nearest production. As the Calitrolium acreage bounds the Transport property on the north and west, early offset operations will be required.

Pacific Oil Co. patented lands bound the Transport lease on the east and south; it owning all of secs. 3-11N-23W, to the east, and 9-11-N-23W, to the south, a total of 1280 acres where no development has been undertaken. The Pacific also owns other entire sections of the south and east.

Comanche Point Possibilities

On the Tejon ranch, where the Comanche Point well, is regarded of little current significance because of its peculiarly sweet characteristics for low gravity crude, there is, nevertheless, a possibility that more important accumulation exists. Anderson pointed out that in this area "some of the geologic conditions suggest the possibility that oil may be present, although others lead to the conclusion that the chance is slight." This area was described as lying along the edge of the hills near the mouth of Tejon Creek, northeast of the Tejon ranch house.

That one may understand the task confronting the Standard in its development of Wheeler Ridge, it is of interest to describe the south end of the San Joaquin Valley, which is an almost level plain that is terminated "rather abruptly by the surrounding hills. It is open toward the northwest, but is bordered on the northeast and east by the Sierra Nevada; on the southeast by the Tehatchapi Range, which trends northeast and southwest and forms a connecting length between the Sierra Nevada on the northeast and the Coast Ranges on the southwest; on the south by the San Emigdio mountains, into which the Tehatchapi Range merges at Tejon Pass; and on the southwest by the Temblor Range.

"Along the sides of the valley the plain is separated from the mountains by a rolling foothill belt several miles wide, but at the south end the foothills are less continuous and where present form a narrower belt, the valley being hemmed in for the most part by steep slopes.

"Wheeler Ridge is described as formed of an elongated dome in the later Miocene strata at the outer edge of the Tertiary belt and projects eastward as one of the spurs that enclose the reentrant at the southernmost tip of the San Joaquin Valley. The foothills rise abruptly from the edge of the valley and have a rugged outline, the constituent ridges rising continuously from the valley into the mountain slopes; and the elevation of the Tertiary belt rocks reaching more than 3000 feet above the valley floor.

Task at Wheeler Ridge

"These conditions, which are indicated by the accompanying illustrations, give a partial perspective of the task undertaken by the Standard Oil Co. when orders were given for the drilling of a first well. On Feb. 16, 1921 its men were notified to begin a 'wildcat' test on Sec. 26-11N-20W, instructions specifying that actual drilling was to be under way by March 12, next.

"The location was fully 35 miles from the base of operations and the first move necessary was to establish temporary headquarters. Then, guided by a company geologist, the Standard's engineers selected a location at an elevation of 1198 feet and motor trucks began transporting material to Wheeler Ridge from Taft. Because of the grades leading up to the location, two tractors were transferred to this point to tow the motor trucks up the steepest inclines. Both were often employed in assisting a single truck.

"With all material on the ground, drilling rig and camp under construction, the next problems to be met had to do with the securing of water and fuel. The fuel problem was not a great one, it is pointed out in the Standard Oil Bulletin, house organ of the company, the Midway Gas Co's. main line, carrying natural gas from the Midway and Elk Hills fields to Los Angeles, passes within two miles of the well location. Two miles of two-inch gas line were laid, tying in with the gas main, and the matter of fuel ceased to be a problem.

"Water was not obtained so easly, not with such dispatch, it is pointed out. There were no water wells or streams near the scene of drilling operations. Searching parties scouted back to the higher hills on surveys for water. A supply was located about seven and a half miles distant from well No. 1, at an elevation of more than 2000 feet and arrangements were immediately made to draw on this source, known as Tecuya Creek. A 2½ inch line was laid from it to well no. 1, through which the water gravitated under 6000 pounds pressure.

"The water thus obtained from Tecuya Creek, however, was not available when the Standard's men were ready to "spud in" because of the time required in its development, and the drilling was started without it. As with the domestic supply, the Standard points out "water for stream purposes was hauled in by tank trucks. When the Tecuya Creek water was made available it proved far from satisfactory for boiler purposes, but it served. It carried a high percentage of salt and other minerals, and necessitated the cleaning of boilers almost daily during the drilling of this first well. For domestic use water was obtained from Taft, which necessitated a thirty-five-mile haul for tank-trucks.

First Test Unsuccessful

"Oil is where you find it, and it was not found at the location of our Well No. 1, Section 26, which was drilled to a depth of 5130 feet, and abandoned after numerous unsuccessful tests for oil were made at different depths. The entire operations on this dry hole cost upward of $175,000.

"Our men in the field now received instructions to drill a second well, and this time the order designated the northeast quarter of Section 28, T. 11 N., R. 20 W., as the scene of operations. This is about two miles west of the unsuccessful well on Section 26, from which pipe-lines for water and gas were laid to the new location. Rig material was hauled to the spot by tractors, which proceeded directly over the hills on a course that could not be considered even for motor-trucks. Meanwhile a road to the location was in course of construction, and was completed at the end of ninety days, at a cost of $15,000 It has an average grade of more than fourteen per cent.

"Well No. 1, on Section 28, was begun June 4, 1922. Tests on slight oil-showings between depths of 1525 and 1765 feet did not indicate the presence of oil in commercial quantities. The hole was carried down to a depth of 2185 feet, plugged back and brought in at the depth of 2130 feet, with an initial production of 270 barrels of 25.5 deg. gravity oil, on November 24,1922. This is our discovery well on Wheeler Ridge, and it afforded the company executives a good basis for the belief that our prospecting on Wheeler Ridge had opened up another valuable oil-field in Kern County, which belief subsequent developments have strengthened.

"After No. 1 had been producing long enough to assure the presence of oil here in commercial quantities, decision was made to drill four more wells on Section 28.

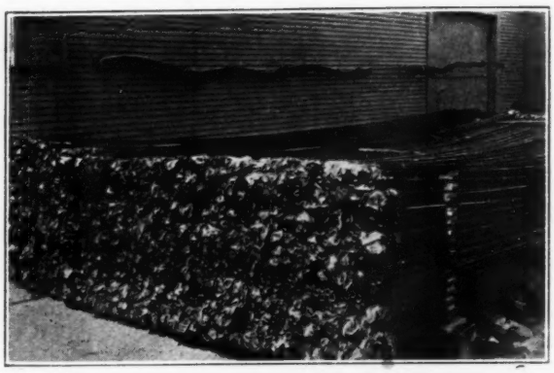
"The decision to undertake operations on a larger scale, in view of production having been obtained, meant that there was a great deal of work to be done aside from actual drilling. The water supply then was inadequate for the extensive drilling campaign planned, and there was urgent need of more and better roads.

Water Supply Miles Away

"Again our water-survey parties went afield in search of this essential to drilling operations. Of the hills and valleys they traversed, of the possible sources of supply they discovered, only to have the water pronounced worthless for our purposes after chemical analysis, only mention will be made. Eventually they found what they sought. It was an even ten miles from our producing property on Wheeler Ridge, at a great deal lower elevation—and to obtain it we had to go lower still, for a well had to be drilled.

"To make this installation a water well was put down to a depth of 665 feet. This well is located in the artesian belt, in the old Kern Lake bed, and it has an artesian flow of better than 4000 barrels of water per day. In order to bring the water to the center of our operations, it was necessary to install a pump at the well to handle 300 barrels per hour, and a booster station at the foot of Wheeler Ridge to relay the water through a six-inch water-main to our properties. The elevation of the well is 280 feet; of the booster station, 675 feet; and of the water-tank installed on Section 28, 2103 feet.

"In order to get the maximum efficiency out of our motor equipment, new and better roads were needed; for to continue hauling material and machinery over a road having an average grade of more than fourteen per cent was impractical, though justifiable during the period when Wheeler Ridge's petroleum possibilities were altogether a matter of conjecture. Now it was decided



TWO MONTHS ago on the Black Panther Oil Company lease north of Drumright, Oklahoma, the tubing parted in Barney Tholloco No. 5 and broke loose 2700 feet of ¾" x 25' Axelson Sucker Rods.

The rods were doubled eight or nine times and badly twisted. They were finally fished out with an alligator socket, after sixteen hours of jarring. As indicated by the section of rods and tubing nailed to the wall in the picture above, the upset tubing was broken and twisted into small pieces.

The Axelson Sucker Rods were not broken or cracked at any point in their entire length,in spite of their drop and in spite of sixteen hours of punishment.

Mr. Rider,Superintendent of the Black Panther Oil Company, is very enthusiastic about the extraordinary strength displayed by these rods.

Axelson Sucker Rods are popular in the Drumright field, as elsewhere. However difficult the pumping conditions, they ask no quarter.

In Oil Field Equipment—the most HUMAN organization in America

Frick-Reid Supply Co.

Tulsa, Okla. Pittsburgh, Pa.

West of the Mississippi—Stores Everywhere

THE GEOLOGY OF PETROLEUM

is the name of the book written by William H. Emmons, which goes into detail describing the more important fields such as the Appalachian, Lima-Indiana, Illinois, Mid-Continent, Gulf Coast of Texas and Louisiana, Rocky Mountain, Canadian, Mexican and foreign fields.

It is a non-technical work of 610 pages, with 254 maps and illustrations, and may be purchased for $6 from—

National Petroleum News

824 Caxton Building **Cleveland, Ohio**

to construct a new road on the south side of Wheeler Ridge extending east to the State Highway, a distance of five miles. This was done—or, to be exact, is being done, for though the road opened to traffic last April, the fifth month after it was begun, it is not yet completed. The maximum grade does not exceed seven per cent, and the average for this road is but 3½ per cent.

"Our improvements in connection with Wheeler Ridge activities include, besides the road described and the splendid water system, numerous tributary roads and a camp consisting of thirteen buildings, headquarters for 125 field men."

Puts Out Non Freezing Radiator Fluid

OIL CITY, Oct. 11.—The Ohio Valley Refining Co. of St. Mary's, W. Va., is putting on the market under the trade name of Freznix, a non-freezing fluid for the filling of automobile radiators for winter use. It is said that the fluid has been thoroughly tested out in actual use over a winter season

It is stated that the stuff is strictly a mineral compound, will not evaporate as freely as water and has none of the hazards common to the use of alcohol and other radiator compounds. If there are no leaks in the radiator, it is said, one filling should be sufficient for an entire winter. The company guarantees that it will cause no damage to an automobile. The fluid does not emulsify with water. For that reason it is absolutely necessary to be sure that the water is all drained and dried out of the radiator before the Freznix is put in if freezing is to be avoided.

In offering the compound to the jobbing trade, the company says:

"Freznix is a prepared liquid all ready to pour into the radiator needing no mixing or additions.

"Freznix is guaranteed against freezing in an automobile motor at any temperature.

"To cool an automobile motor much more efficiently than alcohol and water.

"To prevent rust and corrosion.

"Not to give off an objectionable odor.

"That vaporization does not reduce resistance to low temperatures."

Reamers Roll Out Casing

HOUSTON, Oct. 11.—The engineering department of the Reed Roller Bit Co. of Houston recently came to the rescue of the perplexed north Texas driller who had collapsed casing at the bottom of a 4,000-foot hole, with a novel scheme. It consisted of making a tandem of graduated Reed reamers in which the cutting rollers were replaced with smooth rollers and a pilot on the lower end.

While many jobs have been done successfully with this arrangement, this tandem consisted of seven reamers, the largest being 19¾ inches and the smallest 5½ inches. The tandem was lowered into the casing and rotated. If the casing was not demolished it was rolled out to normal diameter. Thus the risk of losing the hole through explosive was not encountered.

Here And There

CHICAGO, Oct. 11. THE Altitude Petroleum Co. announces the opening of its Chicago office at 29 South LaSalle St., room 1034. I. A. Anson, president of the company, will be in charge of this office.

The company has just closed a contract for the entire winter output of several Texas refineries, on 38-40 straw distillate and 40-42 prime white, sales of which are handled by the Chicago office exclusively. The company reports sales exceptionally good for this season according to Jesse Finston, Tulsa manager.

* * *

MINNEAPOLIS, Oct. 10.—R. H. Heard, for many years associated with the Pure Oil Co. of Minneapolis as vice president in charge of sales, has joined the Federal Oil Co. here as vice president and general manager. Before entering the oil business in 1910 he was for many years connected with the Chicago Great Western Railroad in charge of operating and traffic departments.

* * *

SHREVEPORT, Oct. 11.—The Invincible Oil Co. is starting up the first units of a lubricating refinery here. The plant will operate by a special process installed by E. R. Lederer to produce high viscosity pale and red oils with a low cold test. The refinery will run on crude from the company's own wells in the Bellevue field.

* * *

BALTIMORE, Oct. 11.—M. W. Thomas, president of the Great Eastern Oil Co. reports that his company has just opened two new filling stations here, both of which started off with a bang and are doing a fine business. The company handles a full line of Texaco products.

* * *

NEW YORK, Oct. 10.—H. D. Carter, has severed his connection with the Pierce Oil Corp., as manager of its marine and jobbing departments and is now in the jobbing and marketing business for himself under the name of the Oil Trading Co. with offices at 1106, 165 Broadway. He is also conducting a ship brokerage business.

* * *

SHREVEPORT, Oct. 11.—Capt. Gordon Hewitt, general warehouseman for the Gladstone Oil & Refining Co. is making a survey of his company's property in the Oklahoma fields during the current week.

* * *

LONDON, ENGLAND, Oct. 10.—S. Bramwell & Co. Ltd. announce that they have taken over the business of Joseph Hall & Co. of Manchester. Joseph T. Hall has joined the directorate of the Bramwell organization and will represent that company in Manchester.

* * *

NEW YORK, Oct. 11.—With the organization of a western sales department in charge of H. W. Dodge as sales manager with headquarters in Denver, and the operation of its new refinery at Casper, The Texas Co. announces that it has now completed "The complete cycle" in the oil business, production, refining and marketing facilities, from coast to coast and from the great Lakes to the gulf. Fred W. Freeman is general western manager.

L. B. Underwood

CHICAGO, Oct. 11.—L. B. Underwood, formerly connected with the Union Petroleum Co., became associated with the American Petroleum Products Co., Oct. 1. Headquarters are in Chicago.

* * *

HAVRE, MONT., Oct. 9.—The H. Earl Clack Co. has recently completed a drive-in filling station at Kalispell where it maintains a wholesale plant, reports H. Earl Clack, president.

The Texas Co. is installing a wholesale plant at Havre which is handled on a commission basis by one of the garages, according to Mr. Clack.

* * *

SHREVEPORT, Oct. 11. — The Shreveport Producing & Refining Corp. is constructing two Dubbs units, which it expects to have in operation about Dec. 1. The company is also arranging to supply its refinery with natural gas for fuel from Dolet Hills or Bull Bayou district, which will be transported through its Bull Bayou pipe line.

* * *

SAN FRANCISCO, Oct. 11.—Chester H. Westfall, vice-president of the Marland Oil Co. of Mexico, S. A., is on his way to Ponca City headquarters after a short stay in California. He joined Mrs. Westfall at San Diego after making the trip from Mexico City, where he maintains his headquarters, and together they traveled East via Los Angeles and San Francisco.

* * *

DILLON, MONT, Oct. 12.—The Northwestern Independent Oil Association will meet on Oct. 15 at Great Falls, W. T. Scully, manager of the Pennsylvania Oil Co. here, and one of the directors of the association, announced.

Mr. Scully also states that conditions in his part of the country are improving, sheep men are selling their lambs at a good price and gasoline sales are heavier than last season. "By close attention to business and watching overhead, we are getting along very well," Mr. Scully says.

* * *

PHILADELPHIA, Oct. 11.—The Tiona Petroleum Co. with headquarters here has recently opened a San Francisco office at 625 Market st., with George Armstrong in charge, it is announced by S. P. Worthington, president. Mr. Armstrong, who has lived in California for the past 25 years or more, will handle sales for the whole of the state.

* * *

CAMILLA, GA., Oct. 12.—Stripling Service Station has leased the new two-drive service station recently completed by the Standard Oil Co. here, and will handle Standard products exclusively. The station is equipped with two visibl pumps, wash rack and drain pit. It will carry a complete line of accessories, including tires and batteries, and will open for business on Oct. 13, John E. Strippling said.

* * *

DES MOINES, Oct. 11.—Ralph E. Barrowman was re-elected president and treasurer of the Liberty Oil Co. at the recent annual meeting held here. Will Hartung was elected vice-president and George Barrowman, secretary. These men, with Robert Barrowman and W. A. Roper, comprise the board of directors.

* * *

BELLEFONTAINE, O., Oct. 12.—Bruner & Dennis, owners of a service station here, handling gasoline and lubricating oil, were in Toledo on business, Oct. 8. They report fine business over the past year. Their motto is, "quality and service," D. W. Dennis said.

* * *

WYNNEWOOD, OKLA., Oct. 12.—E. Reveto, refinery superintendent of the Texas Pacific Coal & Oil Co., on Oct. 7 married Miss Louise Kuntz of Kansas City. The wedding took place in Okmulgee.

* * *

DENVER, Oct. 12—A. J. Wolcott, general manager of the Mutual Oil Co., and J. L. Walsh, refinery sales manager, have been spending a few days looking over Colorado with the Denver division manager, A. T. Smith.

* * *

ASHLAND, Ill., Oct. 11.—Moore-Wilson Oil Co. is building bulk stations at Rushville, and Tallula, Ill., and will be operating five bulk stations in central Illinois after Jan. 1. according to Wilbur Moore, manager.

* * *

BLOCKTON, IA., Oct. 11.—The Blockton Oil Co. has just completed a filling station here. The company handles Sinclair products.

* * *

FLORENCE, S. C., Oct. 12.—The Florence Oil Co. of this city, sold out its business recently.

Here's Your Opportunity

You must have a certain amount of knowledge to hold your job but by investing in more than you need for your present job, you are accumulating capital with which to buy a mortgage on a better job—one higher up.

And your capital, Mr. Oil Man, lies in keeping posted on the "news" and "technical" developments in the oil industry as reported and analyzed in the weekly issues of NATIONAL PETROLEUM NEWS.

Judge for yourself the value to you of receiving NATIONAL PETROLEUM NEWS every Wednesday from the comment of one of our readers:

> "Any one connected with the oil industry who can't find something to benefit him in NATIONAL PETROLEUM NEWS, wouldn't find any interest in a 1,000 barrel oil well, as the oil business is certainly covered from A to Z in the NEWS.

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Asks Opinion On Rule For Tank Trucks

NEW YORK, Oct. 11.—Special attention of the oil industry is called in a bulletin of the American Petroleum Institute, signed by Dr. Van H. Manning, director of research, to the proposed Specifications and Tolerances for Vehicle Tanks," which has been tentatively prepared by the Annual Conference on "Weights and Measures," which was published on page 51 of the Oct. 10 issue of **National Petroleum News.** The bulletin says:

"Your attention is respectfully invited especially to Specifications Paragraph No. 3 providing for an expansion space of 2 per cent and Specifications Paragraph No. 6 providing for complete delivery from any compartment when the vehicle is standing in any position on a roadway having a slope up to 5 per cent (3 deg.)

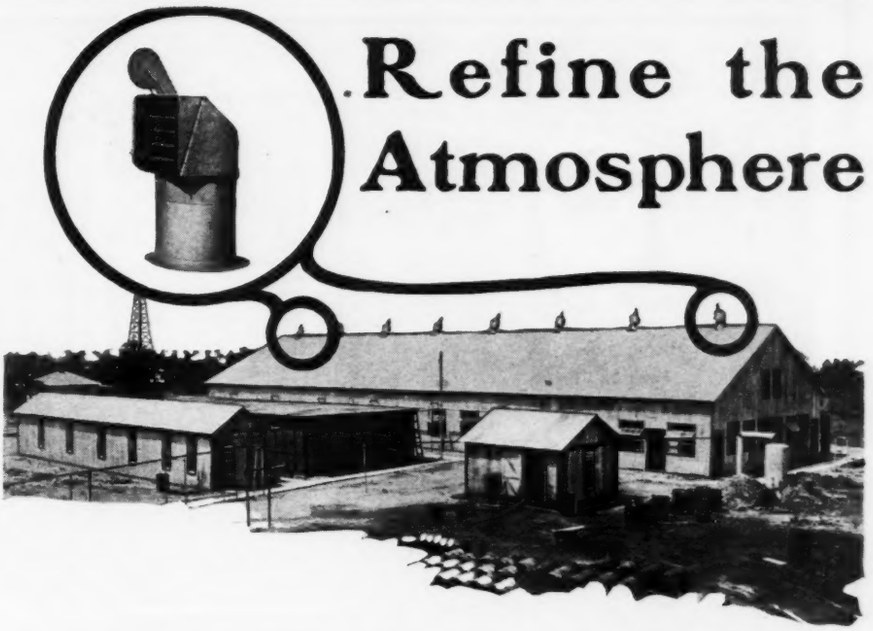
"There seems to be but little comment regarding the 2 per cent expansion allowance over the marker. On the other hand, a rigid enforcement of Specifications Paragraph No. 6 might result in the scrapping of most tank trucks in use at the present time.

"Prior to the presentation of these specifications at the 16th annual meeting no oil companies or manufacturers had an opportunity to review them. You are requested to pass this material on to the proper department of your company if operating tank trucks and using them as liquid measures, for their careful and earnest consideration. Any comments or criticisms should be referred back to this office if possible not later than Oct. 20, 1923. It is desired to give this matter adequate attention and sufficient publicity to insure a full and wide discussion."

In a report of a representative of the American Petroleum Institute who attended the 16th annual conference, it is pointed out that it is of the utmost importance for the oil industry and the tank manufacturer to keep in close touch with the recommendations made by the weights and measures conference and oppose them if they are oppressive, because the action taken at these conferences serves as a guide for national, state and city legislation on the sealing and certification of weights and measures.

NEW YORK, Oct. 12.—Standard Oil Co. of New York has received bids on several barges to be used in New York harbor and the barge canal.

ST. LOUIS, Oct. 12.—The Missouri Pacific railroad is preparing to convert 104 locomotives on its Louisiana division into oil burners. This has been made possible through the fuel oil it is to receive from the American Petroleum Co. under a contract entered into Jan. 1, 1923.



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Cleveland, Ohio

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Used Oil Equipment

If you want to buy it—turn to the classified advertising page at the back of this issue. If what you want is not listed there, why not insert an advertisement of your own next week?

If you want to sell it—follow the same course.

There is a constant market in used oil equipment. Take advantage of the great savings possible, either by selling what you no longer need or buying what you do need.

National Petroleum News
892 Caxton Building **Cleveland, Ohio**

Only the Veteran's Experience Could Produce This Hose At This Price

NATIONAL gasoline hose comes in answer to a demand that many hose users have long expressed.

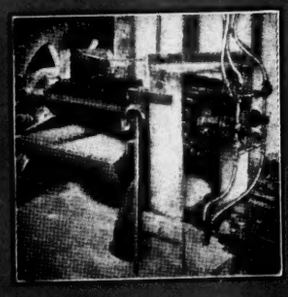
Formerly the only good hose obtainable was priced higher than many purchasers felt they wanted to pay. Yet a cheap hose invariably meant a poor one.

But now, through the efforts of a group of pioneers, a way has been found to build hose *with the original three-ply construction* at a very considerable saving over the former methods of production—a saving that has resulted in a sharp reduction from the prices formerly charged for this high grade type of hose.

Before ordering any hose, learn how much more your money will buy in the new National.

A corner of the National laboratory where materials are tested for quality and strength. Scientific control over every process.

NATIONAL GASOLINE HOSE CO.
(Incorporated)



One of the specialized rubber mills in the National factory. This modern product is made by modern methods and by gasoline hose experts.

NATIONAL GASOLINE HOSE

Evils Of Crankcase Oil Dilution In Internal Combustion Engines

By William F. Parish

Presented Before Automotive Service Association, New York, Oct. 11

A LUBRICATING oil in an internal-combustion engine has three important functions to perform. The first and most important, (a), is to keep the bearing surfaces apart so as to prevent metal from striking metal and avoid consequent wear. The second, (b), is to maintain a lubricating seal between the piston-rings and the cylinder-walls for the prevention of losses of compression and gas. The third, (c), is to burn cleanly without the deposit of an excessive amount of carbon. Cleanness of the engine parts is of prime importance, all other things being equal.

In the early days of the automotive industry, there were no serious problems of lubrication of internal-combustion engines. Stratford has shown by his dynamometer-laboratory tests that the critical viscosity of lubricating oil for these engines is about 180 Saybolt sec. at 100 deg. F. I have shown that the average viscosity of all oils sold for the lubrication of these engines, during the good-fuel period previous to 1913, was about 190 Saybolt sec. at 100 deg. F. In this respect, therefore, the technical laboratory confirms automotive and oil-trade practice and we can take as standard for these engines, operating with fuel having good volatility, an oil of from 180 to 190 Saybolt sec. viscosity at 100 deg. F. These oils were the so-called "dynamo" and fine "engine" oils. They would be classed today as the extra-light motor-oils and are no longer used for the lubrication of such engines. The public even refuses to buy the oils that are classed as light motor-oils some of which were the special heavy oils used for racing and similar work in the early days.

The wear on the engine during this period was not excessive. There was no general increase in the number and size of bearing surfaces, which is the engine builder's first reaction to reports of excessive wear, until volatile fuels began to become scarce and heavier fuels were substituted. This was at a time when there was considerable activity in improving carbureter devices. It was also before the lubrication of these engines under the changed fuel conditions, which introduced a contamination factor, assumed the aspects of a problem.

Present Lubrication Problems

The lubrication and wear difficulties with which we are now confronted, in connection with the lubrication of more than 13,000,000 automotive engines, is the direct result of a marvelous mechanical development that has been too sudden to permit the maintenance of the factors of fuel, lubricant and engine in their proper balance. When internal-combustion engines were first built, the fuels available were very volatile and could be vaporized easily. Commercial gasoline was used extensively as a cleaner for clothes and gloves during this period; articles so cleaned would dry quickly and no odor would linger on them.

Such gasoline did not form into liquid drops in the engine cylinders to drain into the crankcase, when used in an automobile engine. In leaking into the crankcase in a dry gaseous state during the compression stroke, gasoline of this high volatility did not combine with the oil to such an extent as to dilute the lubricant, although small particles of road dirt might be present and probably accounted for most of the wear that took place in the bearings and in the cylinders.

Under these almost ideal conditions, the problem of lubrication for the automobile engine was no more serious than that of the lubrication of any other piece of machinery that would operate with undiluted oil, but that had some occasional space for dirt to enter and produce wear.

MR. PARISH, who is a lubrication expert of wide experience, having had charge of air service lubrication during the war, corroborates the theory of J. L. Murray, president of the Corn Belt OilCo., Bloomington, Ill., which Mr. Murray gave the Indiana jobbers at their meeting at Fort Wayne, last summer and described in the July 25, issue of **National Petroleum News,** that the motorists of the country are paying a repair bill on their cars of $500,000,000 a year that would not be necessary if they changed their oil frequently enough.

The figures given by Mr. Parish on the annual repair bill of American motorists coincides exactly with that of Mr. Murray, and he backs it up with charts showing the increase in the purchase of replacement parts over a period of years, out of all proportion to the number of new cars placed in service. These figures furnish the jobber with a mighty talking point to use in increasing his sales of motor oil—Editor.

As the production of internal-combustion engines increased toward the millions, the original grade of gasoline of high volatility became scarcer. The question arose whether to limit the engine-fuel production to this grade of gasoline and raise its price, in consequence, or to produce as much fuel as might be called for, at a reasonable price. The latter policy was only possible by making constant changes in the volatile nature of the fuels as the demand increased.

Present-day commercial-gasoline is too heavy for use as a cleaning agent; its odor lingers and part of the kerosene it contains does not evaporate from the article cleaned. What has happened is that the original highly volatile gasoline has been stretched out by adding more of the heavier products that formerly were put into the fuel oils. As an immediate consequence this required the utmost development in carbureting devices, improvement in manifolds and the introduction of heaters and hot-spots, all being for the purpose of helping the automobile engine to utilize the heavier fuels.

Crankcase Dilution of Oil

Recent Government tests show that internal-combustion engines are now able to utilize fuels much heavier than those we are getting today. The main trouble is that dilution of the lubricating oil in the crankcase of the engine proceeds at a greater rate as the fuels become heavier, or less volatile. There was very little of such dilution with the original highly volatile fuel, but there is great dilution with the present fuel. There will be more dilution with the future fuel, should economic demands force producers to make it heavier.

It has been determined that crankcase dilution, or contamination of the lubricating oil by the present internal-combustion-engine fuel, is subject to certain general rules. Dilution begins at zero, with new oil, and increases gradually at a somewhat regular rate. The amount of fuel dilution of the oil is greater in cold weather. In summer, the amount of dilution, or contamination, within the same length of time, is less, because the engine is hotter and it boils-off the lighter parts of the fuel from the mixture in the crankcase. Apparently, fuel of a certain volatility will dilute the oil to a point where there is a balance, and continued excess leakages of fuel are thrown-off as vapor through the breather.

When this balance is secured, the mixture of fuel and oil in the engine crankcase has lost its best characteristics as a lubricant; then, it partakes more of the nature of heavy kerosene, contaminated with carbon, metal particles resulting from wear, and road dirt, all of which act as perfect abrasives with the thin fuel-and-oil mixture. Oil in this condition has lost its power as a sealing agent that will prevent losses

of compression pressure and gaseous mixture.

Effects on Viscosity

The effect on the viscosity or body of various oils of adding fuel to them is shown in Fig. 1. The lower portion is shaded below 180 Saybolt sec. viscosity. This degree of viscosity was determined by Stratford as being the critical point for internal-combustion-

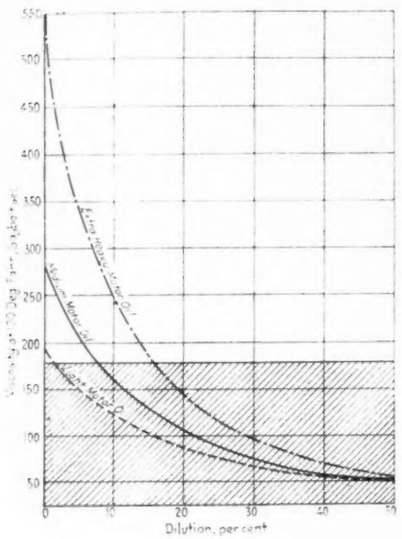


Fig. 1—Chart showing the effect on the viscosity of various oils of adding fuel to them.

engine lubrication, supported by the custom of furnishing oil of 180 to 190 Saybolt sec. viscosity for engine lubrication at a time when there was no dilution to complicate the problem. From this chart, it is obvious that the light motor-oils cannot be used with more than 2 per cent dilution or they will enter the dark area; that is, these light oils with 2 per cent of fuel added are too thin for the engine, according to the best advice we have as to a standard for lubricating the engine. Medium oils having 8 per cent of dilution will enter the dark, or wear, area shown in Fig. 1. Extra-heavy oils will withstand 16 per cent of dilution with fuel before they are made thin enough to bring them into the wear area.

At this point, I wish to sound a warning note. The motoring public has known more in a general way about this oil-dilution condition than has been acknowledged generally by the technical men in both the oil and the automotive industries. Contrary to recommendations made by the oil and by the automotive industries to use the lighter oils, the public stopped buying these oils and changed to the use of the heavier grades to such a surprising degree as greatly to upset the entire lubricating industry during the period from Oct., 1919, to April, 1920, as shown in Fig. 2. Evidently, there was excess wear and trouble at this special period.

The light oils were contaminated by the fuel to too great an extent in too short a time, there was a partial relief in using the heavier grades and in consequence, the supply of these oils was soon exhausted. It should be evident to all that there is a public factor in the problem, and that it must be given careful consideration.

The effect of the use of the thin oil-and-fuel mixtures in these engines should be appreciated. With these thin mixtures of oil and fuel, lubrication is not progressing satisfactorily and, in consequence, wear is taking place. This wear may continue for some time before it causes any marked change in the physique of the engine, and nearly all of the ills of the engine can be traced to this condition. Oval cylinders are caused by wear, because the surfaces are not lubricated with clean oil that has sufficient body to keep the surface separated. Worn piston-rings, worn pins and worn bearings, are all caused by lack of lubrication due to the use of the thin mixtures of oil and fuel. The effect of this general wear is seen in that the thinned oil is pumped-up into the explosion chambers, there to form and deposit carbon and interfere with the proper operation of the ignition system. Other bad effects are loss of compression pressure, the noisy operation of the engine, loss of power and control, burning-out of bearings and, finally, the necessity for major repairs that are so much talked about in connection with the ownership of a car or a truck.

Wear As An Actual Fact

In the discussion of this dilution problem, the fact that wear takes place has not been established in so definite a

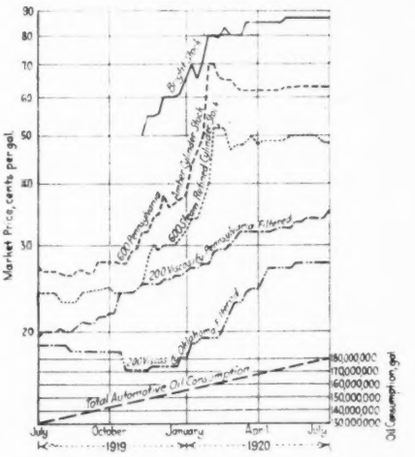


Fig. 2—Chart giving the prices of various grades of lubricating oils for the year ended June 30, 1920, at a time when there was depletion of stock used in making motor oils.

manner as have the facts of contamination and dilution. The facts regarding wear apparently were so plaintly evident that they were not appreciated. We must revert to the basic principle that the lack of lubrication, through the use of contaminated oil, causes wear. This wear must be reflected in the demand that exists for repairs and for spare parts.

This demand could have been met through the increased effort of the engine builders, but because of trade conditions an auxiliary industry has been founded for the purpose of supplying these important spare parts to the repair shops that are outside of the control of the automotive industry. In 1914, the automobile trade directory listed 50 such concerns, and the total number of branches of this trade was 6. In 1923, this spare-parts industry had grown to comprise 698 concerns, and the total number of branches of the trade was 17.

Fig. 3 is made up from the registration of motor cars and trucks for the years 1914 to 1923, on the basis of gains each year in percentage. The total gain for the period was 700 per cent. The registration of passenger cars and trucks was divided into four groups of 4, 6, 8 and 12-cylinder engines. This was for the purpose of obtaining the correct number of parts in use. An investigation was made to determine:

(1) How these various parts were replaced yearly.
(2) The value of these parts.
(3) The value of the service labor involved in their replacement.

These determinations were made by Mr. Prescott from many previous studies, and after consultation with experts.

From 1914 to 1916, the increase in the replacement of piston parts followed very closely the increase in motor-vehicle registration but, in 1917, the fuel mands for export, coupled with the increased demand caused by the entry of this country into the war, caused a decided decrease in gasoline volatility. According to the 1915 to 1917 Bureau of Mines' survey, the maximum end-point of the fuel increased from 380 to 450 deg. F. It is a matter of common knowledge that fuel conditions in 1917, for all motor vehicles outside of government control were relatively bad, due to necessity, because the best fuel was reserved for war purposes. This, of course, would lead to greater dilution troubles in the motor equipment operated by the general public, and this naturally would be reflected in greater piston-parts replacements during the period stated.

Fig. 3 shows that the replacement of pistons and piston parts has increased with much greater rapidity than has the number of cars and trucks in operation. The two largest increases came in the years 1916 and 1917, just prior to our entry into the war. The next great increase in number of spare piston-parts was in the 1919 to 1920 period, in which the condition of the fuel was such as to be the subject of

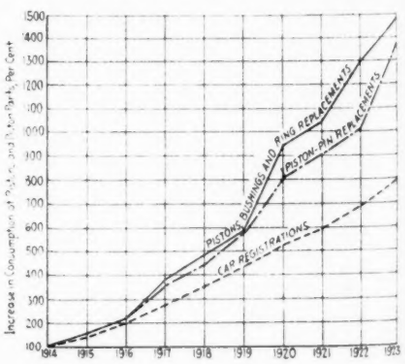


Fig. 3—Chart showing yearly percentage of increase in consumption of pistons and piston parts from 1914 to 1923, using 1914 as 100 per cent.

special meetings of the various petroleum and automobile societies. The maximum end-points for the fuel reached 500 deg. F., as shown by the survey made by the Bureau of Mines in July, 1920.

This situation naturally would result in greater wear to piston parts, and this is shown by the chart of replacements. It was at this time that the dilution condition caused a public reaction against the oil and the automobile

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companies' recommendations for the general use of the light and medium oils. The result was that the great and unlooked for demand for the heavier lubricants entirely upset the market and refiners' stocks. Through specifications and co-operative work with the oil industry, the efforts of the Society of Automotive Engineers had some effect in reducing the high peak end-points that were shown by the surveys. The end-points are apparently still high and rapid increase in replacements continues.

Recent Parts-Replacement Equipments

The consumption of pistons, piston bushings and piston-rings increased 1480 per cent from 1914 to 1923, and that of piston-pins increased 1380 per cent. Registration covering the same period increased only 700 per cent or about one-half that of worn-out and replaced parts.

The value of replacement parts has increased from $11,000,000 in 1914 to $198,000,000 in 1923; this is an increase of 1800 per cent. When we add the cost of service labor, the public charge is approximately $450,000,000.

The figures stated do not take into consideration replacement parts for used cars, which are repaired by factory dealers or factory service-stations. About 2,000,000 cars per year are so handled. This would add at least one-third more to the consumption figures shown in the chart, and probably $50,000,000 more to the value. Figured in this manner, the total cost of replacement due to the effects of piston-parts wear on the national motor-vehicle equipment, is close to $500,000,000 this year, with all indications pointing toward a material increase for the coming years. This is a large sum to assess the public for the privilege of operating poorly lubricated equipment, especially when we remember that this special analysis has not taken into consideration the demand created by new-car production. That has been left out of the picture.

If we should allow this condition to continue, we have the history of mechanical development to show that a severe reaction will take place when it becomes apparent that the engine under present fuel conditions, is no longer commercial. A new type of engine will be developed which will not require these replacements and consequent high cost of operation. Such a type probably will be found in some adaptation of the Diesel engine. A Diesel type of engine will require a much heavier fuel, even a heavier fuel than kerosene.

The automotive industry will be given the task of changing all designs and parts, and the petroleum industry will be required to supply the heavier fuel needed. All this will mean that vast amounts of very volatile fuels of the same quality as the original gasoline for the first engines will need to be disposed of in some newly created market. The present condition of "cracking" the heavier hydrocarbon fuels into lighter fuels will need to be reversed, and a general method found for making heavier fuel products out of the lighter ones.

Practicable Improvements

There is a partial remedy that should have been applied some years ago. As the engine fuels became heavier and as they built-up dilution, the oils should have been changed more frequently. The rule should be established by the Society of Automotive Engineers in co-operatoin with the engineers from the petroleum industry, operating through the American Petroleum Institute, that fuels of a certain character, sold throughout any portion of the year, will carry with them a requirement that all engines be drained at stated periods. For instance, with fuels having an end-point of 425 deg. F. the engines should be drained every 600 miles in summer. With present fuels having an end-point of 438, engines should be drained every 500 miles. Fuels having an end-point of 450 should require that engines be drained every 400 miles. Winter conditions require draining at 150 miles less than the periods stated.

Special fuels can be made, the draining periods for which are more extended. The number of miles allowed before draining is required should be posted wherever gasoline is sold. A system of this kind would guide the motor-vehicle owner as to what is necessary for the better protection of his vehicle, for each grade of fuel. If then, his repair bills are large at the end of the season, none but himself will be to blame.

If the average mileage at which draining should take place should become established and an already worn-out engine shows signs of fatigue under this system of draining, then the new oil used should be of a heavier grade or the draining period should be shortened. This balancing factor is in the hands of every motor-vehicle owner and should be applied intelligently for the preservation of the engine. Draining facilities should be supplied by the petroleum industry at its service stations. Garages should add this feature to the service they provide. Weekly drainage schedules could be established by the owners of motor-truck fleets to great advantage, even if the miles run per truck should be below 500.

Under such a plan, the entire cost to the public would be that of the additional oil. It is estimated that the total cost for lubrication amounts to about 1 per cent of the yearly upkeep of a car. Doubling this would not be a burden when it is considered that the resale value of the used car can be increased $100 to $200. Securing the better lubrication and operation of the engines without causing an excessive repair bill at the end of one or two seasons, by usage of double the usual amount of oil, seems an easy way out of the present difficulties.

Motor-vehicle manufacturers should also agree on the proper length of draining periods. At present, they recommend draining periods of from 500 to 1500 miles. The very best practice should be designated for all makes of vehicle. It is well known that, with a new motor vehicle, the greatest engine damage occurs during the first 1000 miles of travel. During this period, the vehicle should not be driven above a fixed low speed. Oil should be changed at very frequent periods. On the basis of fuels of the 1923 grade, which have a 438 end-point, draining for the first 1000 miles with new motor vehicles should be at intervals of 250 to 300 miles. This will add at least a year to the life of the vehicle, and this is but little extra attention to pay to the new equipment during its very critical running-in time.

To prevent contamination of the lubricant in its most insidious form, the engine blocks, pistons, rods, shafts and especially the crankcase, should be cleaned thoroughly with liquid cleanser before they are put into service on the block or on the road. The regular service motor-oil should be allowed to remain on all surfaces for at least 24 hours, so that the surfaces can become impregnated. This preparatory treatment removes traces of cutting oils and compounds, paints, varnishes and red leads, all of which contain some animal or vegetable matter; also, it removes core sand, metal fillings, dirt and other collected abrasives. Filling with oil and allowing the machine to stand for a short period affords the bearing metals an opportunity to absorb the first film, and this will offer the best protection possible against wear.

Better devices should be provided for the motorist for draining the engine crankcase. At present, it is a disagreeable task to empty the oil out of the average car engine, and this is one of the factors that prevents ordinary care from being given to this important matter. Draining should be made easy; it should not be necessary to go under an engine to remove a plug. Draining should be made possible from the side of the engine without necessitating the use of special tools. The public should insist on an improvement in engines in this respect. Engines should be drained when warm and they should be flushed out with motor oil. Under no conditions should kerosene or gasoline be used for the purpose of flushing out the crankcase, as portions will always remain in the crankcase to contaminate new oil.

Recommendations

Due to the present fuel situation, dilution of internal-combustion-engine lubricating-oil is taking place. This means that the oil soon loses its character as a lubricant, and that it fails to function properly in preventing metal-to-metal contact. Wear takes place under these conditions at an alarming rate, necessitating more than twice the number of replacements of parts that were necessary per car in 1914. Hence, the following recommendations are made:

(1) Engines should be drained at more frequent intervals, so that the lubricating oil can be maintained in a thicker condition.

(2) Kerosene or gasoline must not be used for flushing the crankcase.

(3) Engines should be constructed so that draining can be done much more easily than is true at present.

(4) Greater care should be taken of the engines during the first 1000 miles of travel of the vehicle during this running-in time, the draining periods should be fixed at 250 to 300-mile intervals.

The increased cost for more oil will not exceed 2 or 3 per cent of the entire cost for operation, and the gain will be in hundreds of dollars because of reduced repair bills and the attainment of better used-car values.

ERIE, PA., Oct. 11.—Blake D. Hay has been appointed manager at Chicago of the Williams Tool Corp. of Erie, succeeding Hugo A. L. Mey, who resigned. Mr. Hay has been with the corporation in the factory here for some time.

Effect Of Cooling Systems On Evaporation Losses Of Gasoline

By Ludwig Schmidt

Assistant Petroleum Engineer, Bureau Of Mines

EACH year an enormous supply of gasoline accumulates over the winter months and is subject to losses by evaporation. On the basis of experiments made by the Bureau of Mines, it is estimated that three to four per cent of the gasoline stocks that accumulate between the end of the summer season and the following spring is lost by evaporation.

Several methods are now in general use for reducing these losses. This report presents the results of tests made by the Bureau of Mines on different kinds of cooling systems. The effect of water sprays, water-seal roofs, and insulation on tankage for reducing the evaporation losses of refined gasoline are discussed. It is not the purpose of this report to recommend any particular type of system. The selection of a suitable type of equipment for reducing evaporation losses rests with the individual refiner, for the costs of the construction and operation vary in different localities.

Relation of Evaporation Loss to the Trade Specifications for Gasoline

Before discussing methods for preventing evaporation losses of gasoline in storage, it is important to consider the effect of evaporation on the character of the gasoline.

The different gasolines marketed, such as blends with natural gas gasoline, refined gasoline, and gasoline from cracked distillates, have been discussed in detail by Hill and Dean.* The losses by evaporation of these various gasolines in a given time differ according to the nature of the gasoline; however, the general effect of evaporation on the character of gasoline is much the same for all kinds.

Gasoline may be considered as a mixture of the lighter liquid hydrocarbons found in petroleum. The first fractions to evaporate are the most volatile; therefore they have the highest A.P.I. gravity and the lowest boiling point of any fractions of the gasoline. The escape of these light fractions from gasoline in storage results in a large financial loss to oil refiners, not only because of the reduction in volume, but mainly because the characteristics of the gasoline are changed. The greatest change is a raising of the initial boiling point and lowering of the gravity. The loss in gravity is not difficult to remedy.

However, the addition of low-boiling constituents to lower the initial boiling point or to meet the requirements of the distillation curve is very costly. The loss by evaporation of a small per centage of a tank of gasoline will usually require a relatively large addition of light products. This is due to the fact that the portion evaporated consists of very low boiling hydrocarbons, while the light gasolines available for blending contain considerable proportions of higher boiling material. Blending is usually done at the time of shipment, and this may entail an additional loss to the refiner as he must often make or buy on the market, low-boiling products at a time when prices are the highest. The aggregate losses to the refiner resulting from evaporation of gasoline in storage, therefore, may be considerable and it is to the refiners' best interests to reduce evaporation losses to a minimum.

*Hill, H.H., and Dean, E. W. Quality Gasoline Marketed in the United States. Bureau of Mines Bulletin 191, 1921.

IN THE accompanying paper Mr. Schmidt brings out a point in connection with evaporation losses of gasoline in storage that is sometimes loss sight of by refiners. That is that the most important loss does not come from the quantity of the gasoline vaporized and diffused into the air but from the raising of the initial and endpoint of the stored motor fuel.

A tank of gasoline made to proper specifications as to initial and endpoint, if it is subject to evaporation, will shortly lose the low boiling points to an extent that it likely will have to be blended with natural gasoline to bring it back to specifications. This is expensive, especially when the blending material has to be bought on a high market and constitutes the most important phase of the evaporation loss problem—Editor

Reduction of Evaporation Losses

The following are the four main factors that govern the rate of evaporation of a liquid: (a) Renewal of air over evaporating surface, (b) Temperature of the surface of the liquid, (c) Area of evaporating surface, and (d) Quantity of vapor in the surrounding atmosphere.

Regulation of any one of the above factors will affect the rate of evaporation. There are several methods now in use for decreasing the rate of evaporation by reducing the area of the evaporating surface, as, for example, floating roofs or frothy mixtures to cover the surface of the liquid. These are not discussed here. This report deals with the control of the temperature of the surface of the liquid, and the renewal of air over the evaporating surface.

Vapor-Tight Tankage

A prime requisite for the reduction of evaporation losses under pressure storage conditions is vapor-tight tankage. Vapor-tight tankage will practically eliminate the renewal of air over the surface of the liquid in the tank, except as it may be caused by temperature changes and by emptying and filling a tank. A vapor-tight tank prevents free circulation of air over the surface of the liquid.

In order to provide for the necessary release of pressure or vacuum during the filling and emptying of vapor-tight tanks, each tank is equipped with proper pressure and vacuum relief valves. This prevents the tank roof from being ruptured by bulging during filling or pulled in during emptying; it also prevents any distortion or rupture to the tank roof due to expansion and contraction of the vapors in the tank caused by variations in atmospheric conditions.

"All steel" tankage such as that used by oil refiners is usually provided with roofs varying in thickness from about $\frac{3}{16}$ to $\frac{5}{16}$ inch, laid on steel rafters and attached only to the shell of the tank at the top angle or chime. With such construction it is advisable to set the pressure relief valve for a pressure not exceeding 1½ ounces and the vacuum relief valve for not more than one ounce vacuum on the heaviest tanks. It is essential that gages and thief hatches, manholes, and swing line hatches be vapor-tight.

Many companies prefer to equip their tanks with breather lines and not use vacuum and pressure relief valves. This is satisfactory as it prevents excess pressure or vacuum on the tank and carries the vapors outside of the fire wall. However, if the tank or breather line is equipped with a pressure and vacuum relief valve, enough pressure may be carried on the tank to enable the gager to detect any leaks in the roof. Also, the valve will prevent diffusion through the breather line and practically prevent breathing caused by the frequent but minor atmospheric changes.

Breathing Losses With Vapor-Tight Equipment

With vapor-tight equipment the renewal of air over the liquid surface in a tank is reduced to a minimum. It must be borne in mind that even with vapor-tight tanks and equipment, breathing losses are considerable. For example, if a 55,000 barrel tank which is 30 feet high, is filled to 29 feet with oil, the vapor space between the surface of the oil and the roof is about 34,330 cubic feet. If the temperature increased 40°F., 2,800 cubic feet of gasoline-saturated air would be expelled. If the tank contained only 15

Table 1—Results of Evaporation Tests on Gasoline in Water Spray, Water Seal and Non-Cooled Tank

	Tank No.1 (Spray)	Tank No.2 (Water Seal)	Tank No.3 (No cooling system)
Loss April 24—June 6, Bbls	0.45	0.63	1.54
Loss June 6—July 17, Bbls	1.08	1.48	2.09
Total loss Bbls	1.53	2.11	3.63
Total loss in per cent (35 days) Bbls	0.65%	0.9%	1.54%
Total gravity loss in degrees A.P.I	0.2	0.3	0.6

feet of liquid the amount of air and vapor expelled under the same conditions would be 14,500 cubic feet. The amount of saturation of the air with gasoline vapor depends upon the vapor pressure of the liquid at the temperature (surface temperature) of the liquid stored.

Table 2—Distillation Records of Gasoline in Water Spray, Water Seal and Non-Cooled Tanks

Beginning of Test Gasoline same in all tanks		End of test Tank No.1 (Spray)	Tank No.2 (Water Seal)	Tank No.3 (No cooling system)
First drop	112°F	126°F	129°F	133°F
10%	170	180	181	181
20%	200	205	205	205
30%	222	226	226	230
40%	244	248	248	252
50%	264	268	270	271
60%	290	289	291	295
70%	314	320	324	320
80%	348	356	356	358
90%	390	399	399	403
End Point	435	442	442	448
Recovery	97%	97.6%	97.7%	97.2%
Total rise in initial boiling pt.		14°F	17°F	21°F
Total rise in end point		7°F	8°F	7°F

During the hot summer months the vapor expelled from gasoline storage tanks often contains over 80 per cent gasoline vapors; also during the summer months the maximum and minimum temperature variation of the vapor in the tank is more than 70°F. in twenty-four hours. From a 55,000 barrel tank filled to 29 feet, the breathing loss caused by temperature change of 70°F. is 3700 cubic feet of saturated air or vapor. If this air carried 80 per cent gasoline vapors, the loss in gasoline, assuming 30 cubic feet of vapor per gallon, would be 97 gallons. This does not include the losses from breathing caused by minor temperature changes, barometric changes, wind pressures and other atmospheric changes which at times would double the loss due to one large change in temperature.

Cooling Systems

In addition to vapor-tight tankage, some refiners have installed cooling systems on their gasoline storage tanks for reducing breathing and filling. Others have tried various forms of insulation on tanks or a combination of insulation and cooling, such as a water spray under the insulation on a tank.

The effect of any cooling system on evaporation is twofold; first, it keeps the vapor temperature in the tank more uniform, thus reducing the actual breathing of the tank, and second, it reduces the vapor temperature and the temperature of the surface of the liquid in the tank and thereby reduces the percentage of the gasoline vapor in the air space above the liquid.

When a tank "breathes in" at night, the vapor space above the oil is filled with unsaturated air (i. e. air containing no gasoline vapor). On coming in contact with the liquid, the air absorbs gasoline vapor; the amount which it will absorb depends on the temperature of the liquid surface, the higher the temperature the higher the percentage of gasoline vapor absorbed. During the day the temperature of the air and vapor increases and the mixture expands. Part of the air and vapor mixture is forced out of the tank through breather lines. If the temperature is high, as on a hot day, the air will contain a high percentage of gasoline vapor. As previously mentioned, observations on tanks during the summer have shown that vapor expelled from the tanks contained over 80 per cent gasoline vapor. By means of cooling systems this percentage may be greatly reduced.

Comparative Tests. Test 1.

In order to compare the efficiency of the two water-cooling systems now in use in preventing evaporation losses, a test was made in which observations were taken on three 250-barrel vapor-tight tanks filled with gasoline of 59.5° gravity (A.P.I.) One tank was equipped with water spray and one with a water-seal roof. The third tank had no cooling system of any kind. As these tanks were erected especially for this test, great care was taken in making them vapor-tight. They were of the latest type of bolted construction, with the roofs tied to the rafters to prevent any flapping motion when the tank breathes.

After the tanks were filled, the filling lines were disconnected at the valves and the open ends stopped with plugs in order to eliminate any chance of leakage. The pressure and vacuum relief valves on all three tanks were set at about two ounces.

Each tank was equipped with two gage hatches located on opposite sides of the tank. Great care was taken in gaging the test tank. Two gages were taken at each hatch, one an "outage" gage (with a hook gage) and one an "inage" gage, using a regulation steel tape with a seven-inch plumb bob. At the time of gaging the temperature of the oil was determined, using a thief thermometer.** Temperatures were taken of the gasoline six inches below the surface, the middle of the tank, and six inches from the bottom of the tank. Average samples of the gasoline were taken each time the tank was gaged.

No attempt was made to divide this test into any predetermined parts, observations being made so that the rate of evaporaiton of the gasoline could be determined for average spring and summer conditions.

Table 1 gives the results of the first test.

The actual value of the volume of gasoline lost is considerable, but is relatively small in comparison to the cost of reblending the product to make it meet its original specifications. Table 2 gives the changes in distillation record of the gasoline in each tank.

The above results indicate that a water-spray system is somewhat better than a water-seal roof for reducing evaporation. This is due to the cooling effect caused by the evaporation of the thin film of water on the roof of the tank as well as the cooling of the sides of the tank by the spray. A properly installed spray will cool both the roof and the sides of a tank. The actual cooling effect of the water is

Table 3—Temperatures of Gasoline in Water Spray, Water Seal and Non-Cooled Tanks

Date	Tank No.1 Surface temperature of gasoline	Tank No.1 Average temperature of gasoline	Tank No.2 Surface temperature of gasoline	Tank No.2 Average temperature of gasoline	Tank No.3 Surface temperature of gasoline	Tank No.3 Average temperature of gasoline
May 10, 1923	70°F	63°F	71°F	68°F	82°F	67°F
June 11, 1923	81	75	84	80	92	81
July 17, 1923	89	83	96	90	108	91
Average	80	74	83	79	94	80

Table 4—Vapor Temperatures in Water-Spray, Water-Seal and Non-Cooled Tanks

	Tank No.1 (Water Spray)	Tank No.2 (Water Seal)	Tank No.3 (No cooling system)
Temperatures from April 24 to May 8, 1923. (Spring Temperatures)			
Average high	79°F	79°F	94°F
Average low	56	62	59
Average vapor temperature	68½	70½	76½
Average daily variation	23	17	35
Temperatures of vapors from June 27 to July 4. (Rainy period)			
Average high	89	89	113
Average low	64	78	68
Average vapor temperature	76	83	90
Average daily variation	25	11	45
Temperatures of vapors from July 6 to July 14. (Summer Temperatures)			
Average high	94	98	125
Average low	77	89	79
Average temperature of vapor	82	93	102
Average daily variation	17	9	46

**Wiggins, J. H. Evaporation Losses of Petroleum in the Mid-Continent Field, U.S. Bureau of Mines Bulletin 200, 1922. p. 24.

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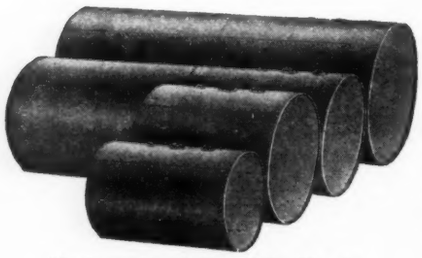

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shown by the temperature records given in table 3.

From the above it will be noted that the average surface temperature of the liquid in the spray-cooled tank is 14° F. below that in the non-cooled tank and 3°F. below that in the tank with the water-seal roof. However, there was an unusual amount of rainfall during the months of May and June. The effect was to lower the difference in the average temperature and thus reduce the advantage of the spray tank. Temperatures were taken July 17 after some twenty days of average summer weather. The average temperature of the liquid in the water-spray tank was 19°F. below the temperature in the non-cooled tank and 7°F. below the water-seal roof.

Recording thermometers placed in the vapor space gave the daily atmospheric variation in temperature of the vapor above the gasoline.

Table 4 gives the condensed records of these temperatures during three two-week periods of the test.

Discussion of Vapor Temperatures

Throughout the test the average daily variation of temperature of vapor in the water-seal tank was much less than that of the other two tanks. The average temperature of the vapor in the water-spray tank, however, was considerably lower than in either the water-seal or non-cooled tank. The ratios of daily average variations and average vapor temperatures between the three tanks varied materially. There were constant showers during May and June. The rains had a tendency to place all three tanks under the same conditions, that is, a water-spray. For example, the average daily variation in temperature between the water-seal tank and the water-spray tank was 6, 14 and 8 degrees during the three periods specified in Table 4. The water-seal tank was more effective in comparison with the spray tank during the rainy season than during the other periods. The reason for this was that the water-seal tank had in reality, a combination water-seal and spray-cooling system a great part of the time.

Conclusions

The question of water cooling is primarily a question of cost. In this test the water-spray tank used an average of 1200 gallons per 24 hours. However, the same amount of water would maintain a water spray over a tank of twice the diameter of the 250-barrel tank tested, for the spray used was an ordinary garden sprinkler with the arms so adjusted as to cover the tank roof. The minimum amount of water was used to keep the arms revolving. Thus the availability and cost of water in a given locality would determine the feasibility of using a water-spray cooling system. The results given in Table 1 show that while the losses by evaporation from a vapor-tight tank are small, a water-cooling system used in the hot summer months will cut the rate of evaporation from a vapor-tight tank in half.

Table 5—Results of Evaporation Test on Gasoline in Water-Spray, and a Non-Cooled Tank

		Tank No.1 (Water seal roof)	Tank No.2 (Ordinary umbrella roof
June 10, 1922	Initial gage net	440.27 Bbls.	437.99 Bbls.
	Gravity A.P.I. of gasoline	58.2	59.1
	Temperature of oil	93°F	93°F
June 20	Gage net	438.56	434.57
	Gravity A.P.I. of gasoline	58.15	58.9
	Loss in gravity of gasoline	.05	.2
	Loss of barrels first ten days	1.71	3.42
	Average temperature of oil	89°F	91°F
July 1	Gage net	438.38	432.7
	Gravity A.P.I. of gasoline	58.05	58.8
	Loss in gravity 2nd period	.05	.1
	Loss in barrels 2nd period	.18	2.67
	Average temperature of gasoline	87°F	89°F
	Total loss 20 days in gravity	.15	.3
	Total loss 20 days in barrels	1.89	5.29

Comparative Test Between Water-Seal Tank and Ordinary Umbrella-Roof Steel Tank—(Test 2)

A test was made at Ponca City, Okla., in June of 1922, to determine the relative evaporation loss of gasoline from a water-seal tank and an ordinary "all steel" tank with an umbrella roof.

Tank No. 1 was a riveted steel tank of 560 barrels capacity. It was 20 feet in diameter and 10 feet high, had a water-seal roof equipped with a water-seal thief hatch and gage hole, and a three-inch valve for relieving pressure and vacuum.

Tank No. 2 was a riveted steel tank of 560 barrels capacity. It was 20 feet in diameter and 10 feet high and had an umbrella roof, equipped with an ordinary box swing-line hatch which also served as gage and thief hole. The hatch cover was not tight, in fact throughout the whole test it was open about one inch due to the swing-line chain that ran between the box and cover in order to fasten outside the tank. The tank was not vapor-tight. There were pin-hole leaks around the top angle and a rip in one of the seams on the roof.

Both tanks were painted white with the exception of the bottom rings, which were black. The test was divided into two periods of 10 days each and the results obtained are given in table 5.

During the first 10 days the water-seal tank lost 1.71 barrels and during

Table 7—Vapor Temperatures ef Tanks Equipped With Water Spray, and Combination Water Spray and Insulation

	June 1 Water Spray Insulated	June 2 Water Spray	July 1 Water Spray Insulated	July 2 Water Spray	August 1 Water Spray Insulated	August 2 Water Spray	September 1 Water Spray Insulated	September 2 Water Spray
Average daily high	90.6	116.5	85.3	110	87.6	111.2	84.4	107.9
Average daily low	71.3	69.5	70.4	71.2	68.9	72.4	61.6	61.0
Average daily variation	19.3	47	14.9	38.8	18.7	38.8	22.8	46.3
Max. temperature	97	135	98	134	99	125	101	124
Min. temperature	69	66	64	60	69	64	46	47

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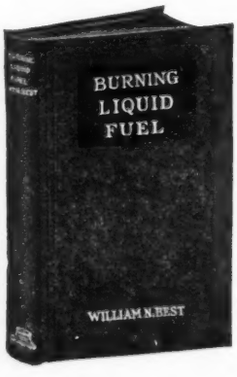

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the second 10-day period it lost only 0.18 barrel. The tanks tested had been in "run down" service at the refinery and were temporarily disconnected for the test. A valve on a run-down line had been left open unintentionally and allowed the vapors from the tank to escape through the run-down line. The open valve was discovered at the end of the first period and closed. The smaller loss during the second 10-day period showed that unless a tank is vapor-tight, considerable loss will occur even when a cooling system is employed.

Comparison of Results of Tests 1 and 2

In reviewing the results of tests 1 and 2 it will be noted that the loss on the non-cooled vapor-tight tank used in test 1 was only 1.54 per cent in 84 days as compared to a loss of 1.21 per cent in 20 days from the non-cooled, non-vapor-tight tank used in test 2. These tests confirm results of other tests which show that the first essential in reducing evaporation losses is the making of tanks vapor-tight. They also indicate that vapor-tight cooling systems are not warranted unless tanks are vapor-tight.

In comparing the two tests the quality of the gasoline used must be taken into consideration. The following distillation record shows that the gasoline used in the non-cooled tank in test 1 was somewhat more volatile than that used in test 2. This also bears out the conclusion that vapor-tight tanks should be used as the tendency for the gasoline to evaporate from the vapor-tight tank in test 1 was greater than in test 2.

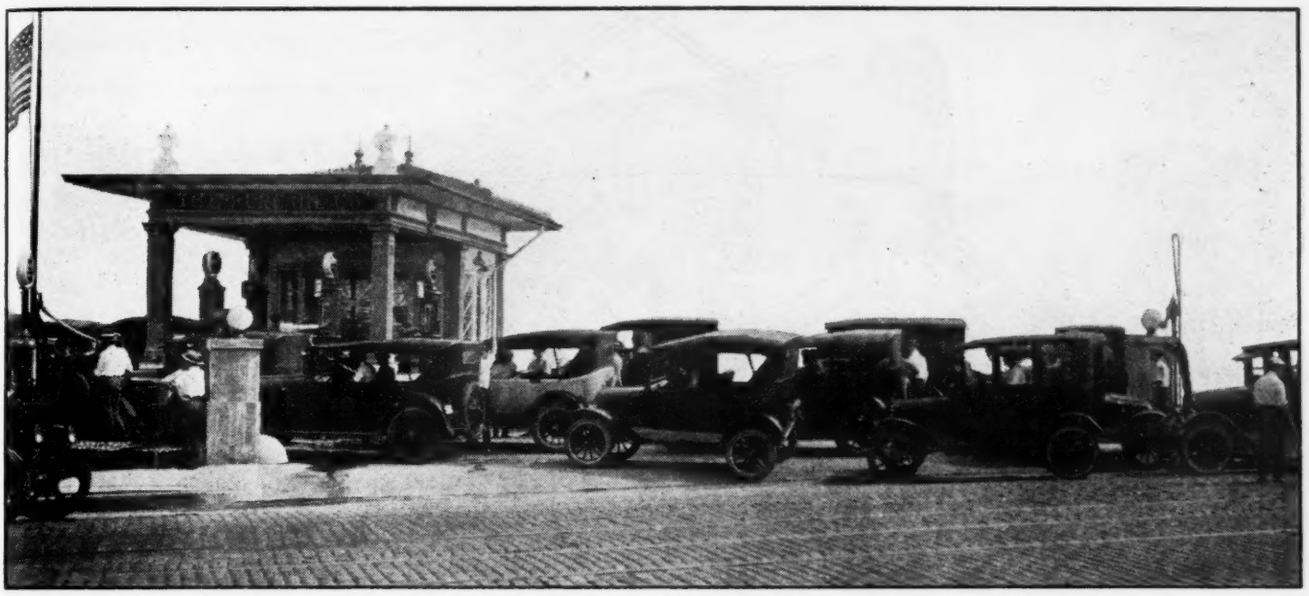
Table 6—Distillation Record Of Gasoline Used In Tests 1 and 2

	Test No.1	Test No.2
Gravity A.P.I.	59.5	58.2
I.P.	112	137
10%	170	202
20%	200	223
30%	222	236
40%	244	252
50%	264	264
60%	290	280
70%	314	302
80%	348	330
90%	390	375
95%	...	404
E.P	435	444

Value of Insulation on Tanks in Reducing Evaporation Losses

Different types of insulation have been used on tanks with varying degrees of success. It is doubtful whether insulation alone can be depended upon to reduce temperatures and temperature ranges satisfactorily during the hot summer season in the Mid-Continent fields. The effect of insulation is similar to that of water-cooling systems in that it reduces breathing losses by reducing temperature variation and keeping the surface temperature of the oil as low as possible.

If a tank is plastered over with some insulating materials, for example, asbestos, the tank will act as a thermos bottle. If the liquid being stored in the tank is pumped from exposed tanks in which it may have acquired a high temperature, the insulated tank will tend to keep the liquid at a high temperature. The actual temperature variations in the vapor space may be reduced but not entirely prevented by insulation. Also a tank is subject to breathing due to other atmospheric conditions. If the gasoline is stored in the tank at a high temperature the



Here is another contestant for the record of gasoline sold in a single day from a filling station.

The station is that of the Pure Oil Co., at Spring Grove and Colerain avs., Cincinnati. The station was opened for business Sept. 1, at 6 a. m. and remained open until midnight. During that time it served 3378 cars with a total of 19,442 gallons of gasoline. The picture shows the stream of cars that were working their way through the station from the opening of the station until closing time.

evaporation losses would be reduced a small amount only.

Many tanks are so insulated that there is an air space between the shell of the tank and the insulating material. By means of dampers, cold air may be allowed to flow around the shell of the tank at night in order to cool the liquid and vapor. During the day these dampers may be closed; the insulation keeping out the heat. Such an insulation would be of no value if the insulated tank was not vapor-tight, for the draft of air would accelerate the rate of evaporation of the liquid by increasing the rate of renewal of air over the liquid surface.

Some companies insulate the roof and part of the top ring of tanks. If the insulation is properly applied it makes the tank roof vapor-tight and also serves to reduce the temperature of the surface of the liquid and the vapor. During the night the whole tank is subject to cooling by the air, whereas during the day the liquid surface and vapor space is shielded from the direct rays of the sun by the insulation on the roof. At no time during the day would over one-half of the shell of the tank be subject to the direct rays of the sun. It is doubtful if this kind of insulation would be very effective for a working tank or one only partly filled with gasoline.

One of the most satisfactory types of tank insulation used at the present time is corrugated asbestos sheeting attached to a steel framework, making a complete housing of asbestos over the entire tank. Considerable space exists between the tank shell and insulation. The housing is open around the bottom and at the top there is a four-foot ventilator for controlling air currents. During the summer months water sprays are placed on the tank under the housing. The air currents ascending from bottom to top cause rapid evaporation of the water film, thus giving an effective cooling action on the tank. The housing also prevents the wind from blowing the spray off the tank.

As the tanks thus equipped were in constant service it was not possible to obtain actual evaporation data. As a substitute, recording thermometers were installed in one insulated tank and in one ordinary tank with a water-spray, so as to compare the temperatures and temperature ranges of the vapor space in the two tanks. Condensed temperature for June, July, August, and September are shown in Table 7, on page 54.

Tank No. 2 was equipped with a water-spray. The spray, however, did not function effectively as it was a single spray on the top of a 66,000 barrel tank. A slight wind would blow the spray so that only part of the tank was covered with water.

In conclusion, attention is called to certain important points in connection with cooling systems for preventing evaporation losses of gasoline in storage.

Cooling systems installed on tanks other than vapor-tight tanks are not effective and are believed to be a waste of money.

Water-seal roofs by nature of their construction insure a vapor-tight roof. The temperature of the vapors within the tank, however, can not be less than the actual temperature of the water circulated over the roof.

Water sprays require a large amount of water but they have a maximum coloring effect. The side or shell of the tank is also cooled by a water-spray. In order to obtain the maximum effectiveness, water sprays should be so placed that wind and air currents will not carry the water from the tank roof, thus wetting one part of the roof only.

Insulation for tanks is generally a permanent fixture. The initial cost may be rather high but the operating cost is negligible. If tanks are insulated without an air space, gasoline to be stored in them should be pumped in at the lowest temperature practicable.

It is believed that types of insulation with an air space between the insulation and the tank are in general more satisfactory, for gasoline may be cooled in such a tank even though it be pumped in at a relatively high temperature.

The following companies actively cooperated during the field work by which data were obtained for this report: Empire Refining Co., Marland Refining Co., Parkersburg Rig and Reel Co., and the Gantz Tank Co. O. D. Horne of the Marland Refining Co. and A. P. Supplee of the Empire Refining Co., assisted with the field work.

T. E. Swigart, superintendent, and N. A. C. Smith, petroleum chemist, of the Bartlesville Station of the Bureau of Mines, assisted in the preparation of the report with valuable suggestions and criticisms. Miss Ruth Brown, draftsman of the Bartlesville station prepared the drawings. H. P. Rue, I. H. Nelson, and L. G. Marsh made the distillatons and gravity determinations. —Reports of Investigations, Department of the Interior, Bureau of Mines.

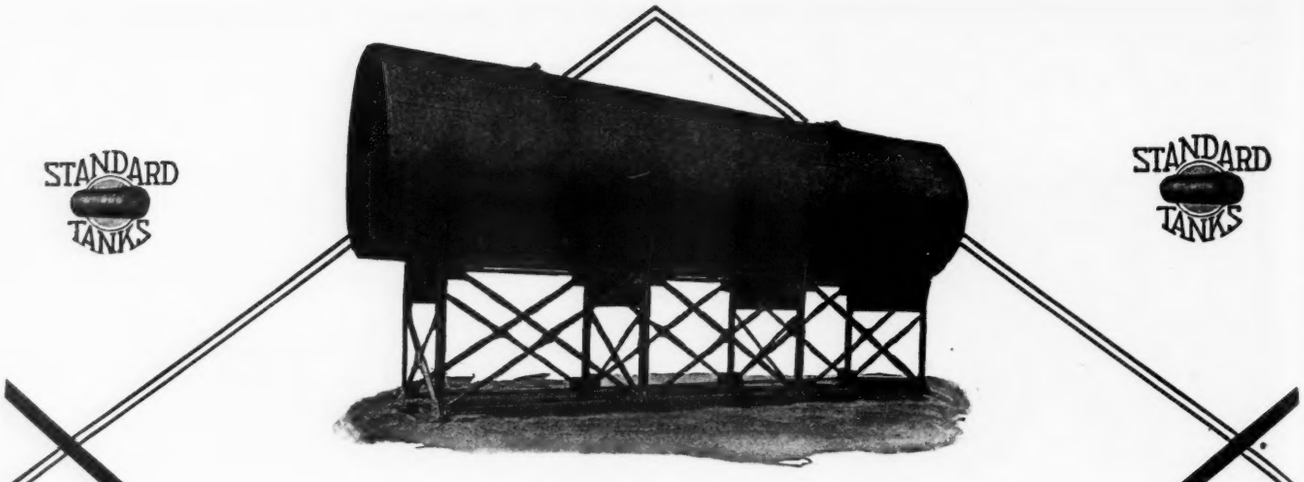
WASHINGTON, Oct. 15.—Bonuses, royalties, and rentals derived from coal, oil, and gas leases on public lands during the fiscal year of 1923 have been distributed to five states by the Department of the Interior.

Receipts from Colorado amounted to a total of $22,325.16 of which the state is entitled to 37½ per cent or $8,371.94.

Receipts from Louisiana totalled $22.32, the 37½ per cent due the state being $8.37.

Receipts from New Mexico were $2,307.19 of which the state is entitled to 37½ per cent or $865.20.

Receipts from South Dakota were only $87.51 of which the state's share at 37½ per cent amounted to $32.82.



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Wife—"John, are you ever going to get matters so arranged that we can afford an automobile?"

Hub—"I am afraid not, dear; but I hope I can arrange things very shortly so we can get one."

—Boston Transcript

"A cheerful old bear in the zoo
"Said, 'I never have time to feel blue.
"When it bores me, you know, to walk to and fro,
"I reverse it and walk fro and to.'"

—Standard Oil Bulletin

John D. Rockfeller and Henry Ford are the world's richest men. John D. made his out of oil and Henry made his out of cans to put it in.

—Pure Oil News

An Irishman and a Frenchman were disputing over the nationality of a friend of theirs. "I say," said the Frenchman, "that he was born in France and therefore he is a Frenchman."

"Not at all," said Pat. "Begorra, if a cat should have kittens in an oven would you call them biscuits?"

—Pure Oil News

Mother—"Was it a good play?"

Daughter—"Splendid, we expected the police to raid it every minute."

—Pure Oil News

"What's that you call your mule?"

"I call him 'Corporation'", replied the old colored man.

"How did you come to give him such a name?"

"Well, sah, I figures that mule gets mo' blame an' abuse than anything else in the township an' he goes ahead having his own way just the same."

—Pure Oil News

An optimist is a man who can look on a ginger ale label, laugh and say something funny.

—Pure Oil News

It is no longer necessary to mow the weeds on the vacant lots. They are all occupied by filling stations.

—Pure Oil News

"Is he lazy?"

"Lazy? Say, that fellow rides in a Ford car in order to save the effort of knocking the ashes off his cigar."

—Pure Oil News

There was a young lady named Astor
Whose clothes fitted her like a plaster
When she happened to sneeze
She felt a cold breeze
And she knew she had met with disaster.

—Pure Oil News

Mr. Blobbs, who is somewhat deaf, dined one evening with friends. When the guests were seated the host bent

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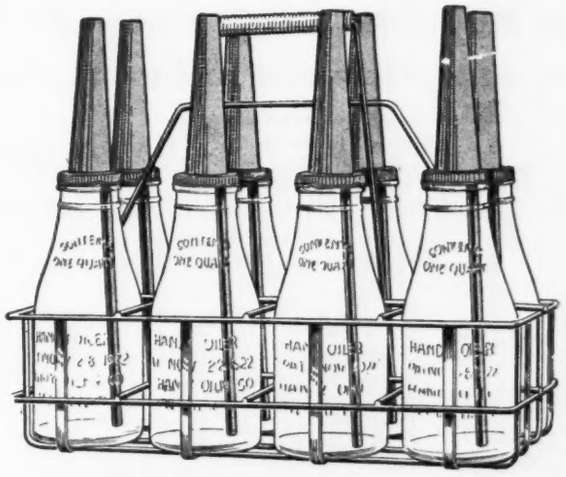

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his head and began speaking in a subdued tone.

"What's that?" demanded Blobbs, who sat beside him.

The host smiled patiently and began in a louder voice.

"Speak a little louder, I don't catch what you say", Blobbs persisted.

A low ripple of laughter went around the table.

The host, his face crimson with embarrassment, raised his voice still higher.

Blobbs did his best to hear, but failed.

"What did you say? he demanded impatiently.

"Damn it, man", the host shouted angrily, "I'm saying grace."

—Pure Oil News

Man (in drug store)—"I want some consecrated lye."

Druggist—"You mean concentrated lye."

"It does nutmeg any difference. That's what I camphor.

What does it sulfur?

"Fifteen scents. I never cinnamon with so much wit.

"Well I should myrrh-myrrh. Yes I ammonia a novice at it."

—Pure Oil News

A graywhiskered old man was sunning himself on a beach at a popular resort when a nifty little flapper in a one-half piece bathing suit smiled at him and asked:

"How old are you, old man?" He sighed and answered,

"Eighty-five, dad-burn it."

—Pure Oil News

Mother's in the kitchen, washing
out the bottles;
Sister's in the pantry taking off
the labels;
Father's in the cellar mixing up the
hops;
Johnny's on the front porch watching for the cops.

—Pure Oil News

Stude—"What did your wife say when she read that you were pinched for speeding at 50 miles an hour?"

Baker—"She had a fit. She has been telling everybody I could do 75."

—Ventura Mission

A little girl saw a dachshund for the first time the other day and cried out: "Oh, look, papa, look at the long wheelbase that dog has."

—Ventura Mission

"Did you see Oliver Twist, Aunty?"

"Hush, child, You know I never attend these modern dances."

—Stanolind Record

Smith—"Hey, there, Don't spit on the floor."

Mike—"S'matter, floor leak?"

—Hawkeye Weekly

"I wish I were half Irish and half Jew instead of all Irish," said Jack.

"Why?" asked Henry.

"An Irishman always wants a dollar and a Jew always has it."

—Hawkeye Weekly

PRODUCTION SECTION

Low Prices Prevail In Auction Of Navajo Indian Leases

By Paul Wagner

STAFF REPRESENTATIVE

SANTA FE, N. M., Oct. 15 THE Navajo Indians of New Mexico and Arizona have a long, hard road to travel before they reach the state of affluence of the Osages in Oklahoma. This was indicated Oct. 15 when four exploratory tracts and 18 smaller leases on the Hogback structure within the Navajo reservation were offered at the first land auction of the tribe.

The four exploratory tracts totaling 16,080 acres aggregated successful bids of $65,500. Eight of the 18 tracts of 640 acres or less each totaled successful bid prices of $18,600. The remaining 10 were without bidders and were passed. No sealed bids were received by H. J. Hagerman, commissioner of the Navajos, although sale regulations permitted such bids to be read immediately after the first offerings of those present.

The Gypsy Oil Co. of Tulsa, represented by Vice-Presidents Henry McGraw and Otis McClintock took for $46,000 the first tract offered after spirited bidding between the Gypsy and the Fensland Oil Co., represented by President T. B. Hoffer who was accompanied by a corps of his men. This property comprises 4000 acres on the Tocito structure, located about 15 miles southwest of the Hogback structure where Midwest Refining Co. has two wells producing commercial quantities of 60 gravity crude. The Tocito Dome is in T. 26N, R. 18W.

Protest against the offering of the Tocito structure was made in the name of W. E. Lockhart, vice-president of the Producers & Refiners Corp., because it was stated that Lockhart had filed application which it was declared the superintendent of the reservation had approved but which the secretary of the interior had turned down. Commissioner Burke, who was present, then denied the claim. He denied approval by the Navajo tribe or any council authorized to speak for it. Then a similar protest to that of Mr. Lockhart was presented on behalf of J. J. Hall, whereupon Burke said that this previous statement again applied and that "it wouldn't make any difference anyhow, because the secretary's approval was required."

The Table Mesa structure of 3200 acres and which is midway between the Tocito and Hogback domes, went to J. C. Bailey, of Colorado Springs, for whom A. E. Carlton carried bidding to $17,500. The other two exploratory tracts got no bidders at the morning session and the auctioneer, Col. E. Walters, of Skeedee, Okla., announced at the afternoon resumption of the sale that efforts had been made to get opportunity for flat basis negotiations later. This, he said, would not prevail, thereby announcing that successful development of important oil production within the Navajo reservation will mean numerous sales in the future similar to the Pawhuska auctions of the Osage leases.

S. C. Munoz, president of the New Mexico Central Railway, got the Rattlesnake structure near Shiprock, which consists of 4080 acres, for $1,000. The apex of the Shiprock, or Rattlesnake dome, is located about 12 miles west of the top of the Hogback structure. The Beautiful Mountain structure of 4,800 acres and which lies west of Tocito dome, went to Neill B. Field, of Albuquerque, attorney for the New Mexico Central Railroad. A bid of $1,000 only was required.

Midwest Refining Co., which already controls 4800 acres on the Hogback, already had the legal limit and was not a bidder. The eight tracts sold out of the 18 offered consisted of 560 acres out of 14-29-17, for which J. C. Bailey paid $3,500; of 400 acres out of 12-29-17, for which J. C. Thurmond paid $5,700; of the east half of 26 and the west half of 25-29-17, for which J. C. Bailey paid $6,500; of all of 6-29-16, for which interests identified with S. C. Munoz paid $2,000; of all of 2-29-17, sold to the Munoz interests for $1,800; all of 10-29-17, sold to Franklin A. Wagner of New York City, for $500; all of 22-29-17, sold to W. R. Dehart and H. R. Johnson of Los Angeles, for $1,000; the east half of 34 and the west half of 35-19-17, sold to Franklin A. Wagner for $700; of 640 acres out of Secs. 36 and 31 to E. W. Weddell, of Okmulgee, Okla., for $600.

Sales of Tracts 7 and 10, which went to the Munoz interests and J. C. Thurmond, respectively, were protested for Guy Hooper, who holds lease from the state of New Mexico which grantor made the reservation that if the courts decide against it the lease is intended to preserve only such equity as exists. The question is whether the San Juan River is a navigable stream and in case it is declared navigable the state has valid claim. The case is pending in the general land office in Washington under school land litigation.

Commissioner Burke took occasion to remark that he had known of many claims against Indian lands lodged by individuals and corporations but this is the first time such procedure has been followed by a state.

COMING!

H. C. George, petroleum engineer of the Bureau of Mines, has completed a report on lifting costs on oil in the representative fields of the United States. The information is most timely and will be published in full in the Oct. 24 issue of **National Petroleum News.**

Benedum-Trees Takes Over Reagan Co. Leases

FORT WORTH, TEX., Oct. 15—The Benedum-Trees interests, of Pittsburgh, a week ago closed a deal with the Texon Oil & Land Co. for the producing well drilled by the latter company in the southern part of Reagan county, the drilling wells of the same company and 12,000 acres of leases surrounding. The Benedum-Trees people will organize a new company, the Big Lake Oil Co. to carry on the development.

The well that was taken over with the acreage was drilled last May. It is seven miles west of Big Lake on University lands. Pay sand was reached at 3025 feet and the well has averaged 175 barrels a day ever since. The sand was just topped when the well started to flow and it has not been deepened.

The Texon company started Nos. 2 and 3, the second one being now down about 2700 feet. The Benedum-Trees interests will start four more wells at once. The Transcontinental Oil Co. has taken considerable acreage northeast and southwest of the well and a number of other companies are also playing this trend.

Powell Production Jumps To 250,000 Barrels

HOUSTON, Oct. 15.—Increase in the production of the Powell field from 190,000 to 250,000 barrels in the past two days, due to numerous completions in the southern part of the field, has brought this area up to a dangerous point. Of this production today the Humble Oil & Refining Co. had 103,535 barrels which is the largest production of any company in one field in the United States.

The largest completions which brought on the high flow were the Humble's No. 4 L. T. Davis, 24,000 barrels and Buttram-Tidal Oil Co.'s No. 1 Crews, 16,000 barrels.

Amerada Attends Show

TULSA, Oct. 13.—Amerada Petroleum Corp., brought in fifty of its principal field men to Tulsa to attend the exposition this week. All lease foremen, material men, scouts, lease men and geologists were invited. Those attending were given a dinner at the Hotel Tulsa by the company.

Lifting Of Proration In Texas Is Cheering To Operators

By Special Correspondent

FORT WORTH, Oct. 13.

THERE is a distinct feeling of optimism in the North Texas district this week, engendered by the new 100 per cent run policy announced by the Texas and Humble companies. And while up to today the other purchasing companies had made no change in their proration orders, even this did not entirely down the feeling that the prophecies of recent weeks, that the upgrade would soon be reached were nearing fulfilment.

From a price of $1, for all grades, the Magnolia's quotation for 100 per cent purchases, the price now is $1.50, for 39 degrees and better, the Humble's top price, and $1.25, the Texas top price. Prevailing prices in the North Texas district, now however are $1.35 for the Humble and $1.10 for the Texas company, the quotation for oil between 33 and 40 gravity by The Texas Co., and from 36 to 39 gravity by the Humble.

The picking up of market prospects was not the only news of importance for North Texas this week.

Archer county promises another new pool, a wildcat coming in for a 400 barrel producer, four miles from production the latter part of the week. This new well is the No. 1 Luke Wilson of Barkley and Meadows, and Lomax, and is slightly south, and east of the Sunshine pool, the nearest production. The sand is the regular 1,580-foot North Archer county pay, evidently, and if the new pool proves to be another like the series developed at present, it will mean much new development.

The northwest corner of Clay county, where there has been some desultory drillir~ had its second producer this week. Knox Finley, who drilled the discovery well, brought in his No. 3 Scott and Randall, for 40 barrels, at 1140 feet.

There have been several failures, in this shallow sand, drilled since the Knox Finley No. 1 was completed. A 270-foot showing is now being tested with a spudder. The two wells already completed are considered sufficient encouragement for further drilling by operators who have been interested here for some time.

The Swastika pool, in South Archer county, the wildcat strike sensation of this spring, shows a completion this week, for the first time in more than two months. The Swastika Syndicate No. 7 Richardson-A is reported a 125 barrel producer, from the regular 1370 foot sand.

Stephens and Eastland counties show one completion each. The Pender Production Co's. No. 1 Davis, East Breckenridge, is a 175-barrel well in the 3,200-foot pay.

The Gordon Petroleum Co's. No. 3 Amis, in Eastland, is making 15 million feet of gas in the 3,200 foot level. Change into an oil well would not be unexpected, it is reported.

There is a slight picking up in new locations reported from the district. The new North Clara pool, Wichita county, and the Electra district, same county, are showing several new rigs at work. Archer county, which has continued fairly active, may be expected to show an increase, in the new area opened up by the wildcat mentioned above.

Daily Estimated Production of Texas Fields

	Oct. 13
Mexia-Currie	46,475
Corsicana-Powell	190,000
Wichita Falls dist.	70,245
Ranger, lime	34,065
Ranger, sand, Young and Shackleford counties	11,995
San Antonio, Luling and Mirando	24,000
Coastal, Texas	83,590
Coastal, Louisiana	6,440
Total	466,810

Powell Extension Brings Chance For Further High Output

By Special Correspondent

FORT WORTH, Oct. 13.—Promise of an extension to the southwest of more than a half mile, 3,500 feet to be exact, and an actual extension several hundred feet west of production, gave the end of the present week the most important developments at Powell in some time.

The E. L. Smith Oil Co.—Wheelock's No. 1 Keith, west of the railroad, and 3,500 feet from the nearest production, on the Phillips lease of the Tidal-Buttram interests, is on the pay, bottom of the hole 2,970 feet, and due for completion immediately.

Results of the first extension on the Phillips are just beginning to show, in the number of new completions. The present promised extension will add still more new territory for immediate drilling.

The week's completions include:

Well	Depth	Production
Tidal Oil Company		
2 — Philips	2,966	8,000
Humble Oil & Refining		
7 — Ramsey-B	2,935	4,200
7 — McKie	2,860	2,400
1 — Cerf	2,976	2,400
2 — Cerf	2,976	5,000
2 — Davis	2,980	4,200
3 — Murchison	3,000	2,400
1 — Murchison	2,976	1,500
11 — Gentry-A	2,935	500
3 — Gentry-B	2,940	500
4 — Humphreys	2,975	3,000
6 — Humphreys	2,980	1,200
5 — Humphreys	2,980	800
7 — Humphreys	2,976	2,500
1 — G. C. Kent, (drilled deeper)	2,930	2,500
4 — G. C. Kent	2,925	2,500
3 — Irvine-C	2,920	2,000
New Domain Oil & Gas		
2 — Kent	2,992	700
Atlantic Oil Producing		
10 — Irvine-B	2,930	300
8 — Irvine-B	2,942	300
R. E. Brooks, Jr.		
1 — Cerf	2,960	6,000
Roxana Petro'eum		
6 — McKie-A	2,915	150
Gulf Production		
1 — Berry	2,900	200
4 — Smith	2,945	100
6 — Sprinkle	2,975	1,000
7 — Sprinkle	2,975	4,500
Buttram-Tidal		
1 — Crews	2,970	16,000
3 — Phillips	2,980	5,000

Completions North-Central Texas Week Ending October 13

WICHITA FALLS DISTRICT

Burkburnett

Company	Well No.	Lease	Depth	Production
Magnolia Petroleum	90	Reilly	620	15
B. C. S. Syndicate	4	H. Beach	1230	10
Gulf Production	12	E. A. Dale	1880	300
McNabb Oil Co	2	Saunders	1830	200
Electra				
Panhandle Refining	2	Myers	2040	Aband.
Magnolia Petroleum	1	Waggoner-B	1740	100
D. T. Finley	2	Ancell	1750	Aband.
Texhoma Oil & Refining	1	Waggoner-H	2000	Aband.
Iowa Park				
Cotton Oil Co	2	Kemp & Kempner	675	15
Archer County				
Chenault & Lea	2	Wilson-C	1580	150
Sunshine State	9	Carter Bros.	1590	450
66 Oil Co	1	Wilson	1580	40
J. E. Dale et al	2	Wilmot	1600	175
J. V. Henley et al	1	Wilson, Blk 24	1590	200
R. M. F. Oil Co	1	Wilson	1580	50
Peyton Gwynne	2	Carter	1580	75
Kentucky Oil Corp	1	Wilson	1490	60
Oil Investment Co	1	Parrish-A	1580	60
Bridwell & Heydrick	5	Carter	1580	350
Archer County-Swastika				
Swastika Syndicate	7	Richardson	1375	125
Clay County				
Knox Finley	3	Scott & Randall	1140	40
Frank Shackleford	6	Panhandle Refinery	320	600,000 feet gas
Panhandle Ref. Co	1	Craig	1890	Aband.
Lone Star Gas Co	5	Panhandle Ref	1540	200,000 feet gas
Lone Star Gas Co	13	Miller	1440	1 m. ft. gas
Eastland County				
Gordon Petroleum	3	Amis	3200	15 m. ft. gas
Stephens County				
Pender Production Co	1	Davis	3270	175 bbls., shot 60 quarts
Palo Pinto County				
Mutual Oil Co. of Nevada	1	Huey	3730	Aband.

W. N. Davis Warns Producers Against Resumption Of Activity

By A. F. Hinton
STAFF REPRESENTATIVE

TULSA, Oct. 13

ALTHOUGH Oklahoma's production has declined something like 130,000 barrels daily since proration went into effect and drilling has fallen off almost to nothing during the same period, Oklahoma producers are warned by William N. Davis, president of the Mid-Continent Oil & Gas association, that the industry generally is still in a very depressed condition, and points out that any resumption of drilling activity at this time would plunge the producing branch of the industry into even greater demoralization than already exists. Reports have reached Mr. Davis, evidently, that operations are beginning to pick up a little here and there, and he sees in this an indication that a general resumption of drilling is imminent.

Has Been Some Increase

From what information the writer has been able to gather, it is apparently a fact that there has been somewhat of an increase in drilling operations, especially since the impression gained ground that the Prairie was about to lift proration, but it did not seem that this increase was large enough to presage a general return to normal activity in the near future. However, Mr. Davis keeps in close touch with conditions, and producers will find his statement well worth reading.

Sees New Disaster Ahead

"Are the oil producers of the Mid-Continent field about to plunge that branch of the industry into even greater demoralization than already exists, by premature resumption of activity?" he asks. "This would seem incredible in the light of lessons which should have been learned from similar mistakes of the past three years, but there are many indications that this is likely to occur. The announcement, disputed by some, that California has passed its peak of potential production, seems to have created a general impression that all troubles of the industry are behind us. Such a belief is without any justification in the facts.

"In the first place, the widely heralded decline in California from a peak said to have been passed in July was at most a loss of estimated potential production which may or may not have existed. It was stated a month ago that the state's production was well advanced in a rapid decline, and that 100 per cent of production was being run," Mr. Davis says, evidently referring to the statement given out by Chairman Guiberson, of the California Producers Association, "but since that time, the decline in actual production in California has been only from 863,000 to 834,000 barrels per day—approximately three per cent—and it is the opinion of not a few well qualified men, after careful analyses of the situation, that completion of wells now drilling will create a new and higher peak between now and the end of the year.

California Still A Problem

"The pools responsible for California's great production are approaching the point of being drilled up, and thereafter, must, of course, decline. The permanent decline may have already set in, but it must take on far greater proportions than three per cent before producers of the Mid-Continent field can take any comfort from it or find any justification for optimism. In the meantime, it should not be forgotten that other California pools already opened up are in course of development, and that wildcatting continues. Under such circumstances, who can prophesy, with any assurance, California's future production?"

In connection with Mr. Davis' reference to other fields in California it is interesting to note that the Standard of California, in announcing its reduction in crude prices, Oct. 9, gave as one of its reasons, "the bringing in of new production, notably in the Torrance field" and also mentioned that there was a "continued over production of oil in southern California."

After having thus disposed of California, Mr. Davis continues: "As to the rest of the country, production from fields east of the Rocky Mountains reached its maximum of 1,425,000 barrels about the end of July. The latest figures show it to be 1,352,000 barrels, reflecting a decline of only 73,000 barrels a day, or approximately five per cent although the most drastic proration has been in force. Additions to stocks of crude east of the Rockies were 6,675,000 barrels in July and 6,050,000 barrels in August. September figures are not yet available, but estimating them at 6,275,000 barrels, we have a total of 19,000,000 barrels for the three months. This is an excess production of over 200,000 barrels a day during the period of greatest consumption. We are now entering the period of reduced consumption, and the excess will be largely increase, except as production declines. Obviously, there must be a decline of 250,000 to 300,000 barrels a day east of the Rockies if the industry is to escape the effect of large additions between now and next May or June, to the already excessive and burdensome stocks of crude on hand.

"I do not wish to be misunderstood. I am not charging the demoralization of the entire oil industry to over-production of crude. On the contrary, overproduction of gasoline was the immediate and principal cause of the chaos which began last spring and has continued increasingly ever since. Stocks of gasoline have been and are still so excessive as to utterly demoralize the market. We are entering the dull season with more than one billion gallons in storage—at least 50 per cent too much for this time of year.

"In spite of the excessive stocks which have existed for a year or more, and the utter demoralization of the marketing division since last spring, refiners of the United States, in August, pro-

Estimated Daily Average Production Oklahoma and Kansas

Oklahoma	Oct. 13	Oct. 6
Bristow	50,000	51,000
Burbank	93,030	95,909
Cushing	25,000	25,000
Healdton	16,275	16,500
Hewitt	20,860	21,000
Tonkawa	57,890	56,501
Osage, except Burbank	26,000	26,520
Wewoka	15,415*	——
Oklahoma, general	96,600	112,000
Total	401,070	404,430
Decrease		3,360

Kansas		
Augusta Douglass	4,000	4,050
Blankenship District	2,625	2,700
Elbing-Peabody	8,460	8,600
Eldorado	18,000	18,250
Florence District	3,100	3,500
Fox-Bush	6,000	6,200
Greenwood County	16,750	17,100
Leon & Weaver	1,300	1,600
Kansas, general	12,000	13,000
Total	72,235	75,000
Decrease		2,765

*Wewoka field not included in table heretofore.

duced approximately 100,000,000 gallons more this year than in the same month last year, thus absorbing practically all of a similar increase in consumption over the same month last year. The month of August is typical of the activities of the refining branch of the industry throughout the preceding months, and it has thus continued in force the full effect of the burdensome and demoralizing stocks on hand during the only period of the year when they might have hoped to reduce them. There is but one remedy for such a situation, and that is a drastic reduction in refinery runs until the stocks of gasoline on hand have been reduced to reasonable figures, with the resultant effect of increased accumulation of crude stocks.

"In the face of facts above outlined, the conclusion is inescapable that there should be a further reduction of drilling activities throughout the districts east of the Rocky Mountains, as well as in California, and yet the trade journals and newspapers through the oil states are carrying optimistic headlines and articles which are encouraging the resumption of drilling.

Still is Unhealthy

"The whole oil industry is sick. The producing branch of the industry has been sick for three years. It has been like a patient running a temperature of 105 degrees, who has insisted upon getting up every time there was a drop of one-half degree or even less in his temperature. The natural result has been a series of relapses, and with each relapse, the patient has been sicker than before. Let us hope that the producing branch will be wise enough this time to wait untill the temperature has dropped to normal, or until they can base their plants for renewed activities upon improved conditions which have already arrived, instead of upon prophecies of improved conditions which are said to be six or nine months in the future.

"In view of the depressed condition of the industry, and uncertainty of the date of its recovery, this is a most unfavorable time to contemplate the opening of new pools. It is regrettable that plans heretofore made by governmental agencies to open for exploration the Navajo Treaty Reservation in New Mexico and Arizona should have culminated in a proposal for a sale of leases on Oct. 15. To produce oil from that new field on the present declining market, thus adding to the demoralization, will, in my opinion, be against the welfare of the Indian owners and violative of the spirit of conservation. This sale should be postponed if possible to do so."

Although Mr. Davis states that production east of the Rockies has declined only five per cent since July, it is only fair to give Oklahoma credit for a much better showing than that, if we take estimates of production June 15 as compared with those of today. These figures show that Oklahoma's peak was something like 530,000 barrels daily June 15, and that since then it has fallen to roundly 401,000 barrels, a decline of 24.3 per cent, or nearly one-fourth, in four months.

Mr. Davis is correct in saying that now is no time to start drilling, and producers may well ponder over his summing-up of the situation. There are producers in Oklahoma, however, who argue that development of new oil fields is not an overnight proposition, and that it would be well to go ahead with new development on the theory that this new oil will be needed by the time it is available in quantity. Their arguments, however, all are predicated on the belief that California is all through for the present as a market-breaker, and this this is a moot question, to say the least of it. It is easily conceivable that a sudden and large decline in California production would be followed by a sharp demand for crude replacements from fields so far not discovered, but from the present outlook, it would seem that discretion is the better part of valor, and that the tools should be hanging for the time being, at least.

Oklahoma's production fell off 3,360 barrels during the past week, according to estimated figures, and is now down to 401,070 barrels daily, or less by 18,000 barrels a day than it was a year ago. Burbank declined 2879 barrels to 93030 barrels during the week, while Tonkawa again showed a small increase, going up to 1389 barrels to 57,890 barrels a day. In the table of estimated production by fields, accompanying this article, the Wewoka field has been added, and will be carried as long as it remains an important factor in the total. This field averaged 15,415 barrels daily during the week just closed, 11 producing wells having contributed to this total Fields in the state other than those mentioned showed but little change from the figures of the preceding week.

Wells Completed

In Oklahoma, during the week just closed, 55 wells were completed, of which 32 were oil wells, five were gas wells, and 18 were dry holes. This compares with last week's figures of 60 total completions, divided 32 oil wells, four gas wells, and 24 dry holes. All the oil wells completed this week were comparatively small in size, their total initial production having been 3944 barrels, an average of about 123 barrels per well.

In Kansas, eight completions were reported this week, divided five oil wells, and three dry holes, as compared with three last week, all of which were failures.

Completions In Oklahoma And Kansas For Week Ended October 13, 1923

OKLAHOMA

Beaver County

Company	Well No.	Location	Depth	Initial Prod.
Empire Oil & Gas Co	1	SWc NE 16-1N-20E	T. D. 3537	Dry

Beckham County

W. D. Shedden	1	NEc 24-9-25	T. D. 3008	Dry

Carter County

Magnolia	3	SE NE 25-2S-3W	2011–2030	400
Wirt Franklin	2	NE NE 25-2S-3W	2231–2238	250
Skelly Oil Co	12	NE SW 15-4S-2W	1242–1274	50
Amerada Pet. Co	2	NE NW 20-3S-1E	2130–2138	45

Comanche County

Glenhoma Oil Co	3	NW SE 23-1-9W	T. D. 2250	Dry

Creek County

W. Phillips Co	1	SE NE 23-17-8	T. D. 3595	Dry
Carter Oil Co	1	NW SE 22-16-8	T. D. 3156	Dry
Eastern Oil Co	1	NWc 16-15-8	T. D. 3830	Dry
J. E. Crosbie	1	SE NE 29-15-10	T. D. 3295	Dry
Tiger Petroleum Co	1	SW NW 30-15-10	T. D. 3570	Dry
Carter Oil Co	2	SE NW 16-16-9	3033–3047	50
Belmont Oil Co	1	NW SE 27-16-9	2972–2974	50
Phillips Pet. Co	3	SW SW 4-15-9	2914–2916	150
Waite Phillips Co	2	SW NE 29-15-10	3265–3271	35
Sam Bright et al	1	SEc 33-16-12	2158–2173	4M
Mattox et al	1	SWNE 15-19-9	2753–2757	150

Kay County

Monahan et al	1	SW NE 16-25-1W	3104–3106	450
Comar Oil Co	7-B	NE SE 34-25-1W	2149–2172	92
Comar	6-A	SW NW 34-25-1W	2497–2553	350
Comar Oil Co	16-A	SW NW 34-25-1W	2510–2537	210
McCaskey & Wentz	41	SW SW 34-25-1W	2530–2593	180
Comar Oil Co	4-B	SW SE 35-25-1W	2172–2183	36

Muskogee County

J. M. Fostz	3	NW SW 27-14-17	1864–1883	2M

Noble County

Comar Oil Co	18-B	SW SW 2-24-1W	1875–1886	115
Comar	19-B	SW SW 2-24-1W	2075–2109	150
Comar	22-A	S½ NE 3-24-1W	2034–2075	83
Comar	9	CSL SE 3-24-12	2623–2637	31
Comar	14-A	NE SE 3-24-1W	2035–2068	67
Prairie O. & G. Co	4	10-24-1W	2132–2166	135

Okfuskee County

Cusik et al	1	SW SE 4-12-10	T. D. 3554	Dry

Okmulgee County

Fee Oil Co	1	NWc NE 35-15-12	T. D. 2260	Dry
D. C. Richardson	8	SW NE 31-15-14	1690–1696	15
King Bros	2	NW NW 6-12-12	2525–2547	125
Sybol, Markham et al	1	SE NW 3-11-12	2600–2610	30

Osage County

Finance Oil Co	5	SE SW 7-22-11	T. D. 1963	Dry
Petroleum Drilling Co	3	SW NE 17-25-9	T. D. 1735	Dry
Sand Springs Home	74	CSW 36-22-9	1530–1550	6M
Owen-Osage Co	244	CSL NW 9-22-11	2088–2105	6M
Seamans Oil Co	1	NWC NE 14-26-8	1745–1770	100
Comar Oil Co	1	SWC NE 21-28-7	2767–2769	50

Osage County (Burbank)

Skelly Oil Co	11	SE SW 23-27-5	T. D. 3060	Dry
Phillips-Skelly	5	SW SE 23-27-5	T. D. 3088	Dry
Sinclair Oil Co	15	NEC SW 20-27-6	2907–2978	112
Sinclair Oil Co	12	NE SW 20-27-6	2915–2962	225

Payne County

Mulberry et al	1	NE SW 24-19-4	3690–3705	20
Magnolia Pet Co	8	SW SW 27-19-4	3458–3505	20
Neely & McGill	1	SE NE 27-18-6	3381–3414	18

Pawnee County

Mutual Oil Co	2	SW SE 13-20-8	T. D. 2830	Dry

Stephens County

Starr et al	1	SE NW 20-2S-7W	T. D. 1410	Dry
Magnolia	2	NEc SW 23-2S-6W	T. D. 2370	Dry

Wagoner County

Harper et al	1	SWc NW 16-17-16	T. D. 935	Dry
Sewell et al	3	SE SW 10-17-16	735–738	3M
Sewell et al	3	NE SW 10-17-16	705–712	50

KANSAS

Butler County

Neely Bros	1	NWc 5-26-4	T. D. 2790	Dry
Dutton & Gillispie	1	NE SE 32-26-6	T. D. 2818	Dry
Faulders & Merriam	1	NWc SE 10-27-3	T. D. 3400	Dry
Okla. Prod. & Ref. Corp	1	NW SW 31-24-4	2692–2720	8

Greenwood County

D. A. Weiss et al	1	NEc NW 31-22-10	2506–2536	125
Cosden Company	1	SE SW 18-22-11	2062–2081	90
Roth & Mission	2	NW NE 22-23-10	2028–2152	40
Pulaski Oil Co	1	SE NE 8-23-11	1895–1940	250

California To Produce 735,000 Barrels, Daily, January 1, Next

By Paul Wagner
Staff Representative

LOS ANGELES, Oct. 12 — ASSUMING that shut-in production of the California fields fails to show any material change in the meantime and the wells remain closed down, a daily average of 735,000 barrels of crude petroleum may be expected to be coming above ground on Jan. 1, 1924. Shut-in production would account for an additional 100,000 barrels, daily, possible to be exploited.

Such a decline would be in contrast to Oct. 1 figures, which were around the 865,000-barrel level, representing an anticipated loss in actual production of 130,000 barrels daily after taking account of the influence of new production in its probable ratio to the decline of older wells.

It is estimated that approximately 14 per cent, or 121,300 barrels daily, of California crude was being stored at the beginning of October. Roundly 54 per cent, or 467,871 barrels daily, were being refined; 26 per cent, or 224,271 barrels daily, were being shipped out; and six per cent, or 50,985 barrels daily were being consumed locallv in the territories where produced.

As against the anticipated decline of nearlv 15 per cent in the three months from Oct. 1 to Jan. 1, next, it is apparent that this loss in production would balance with the quantity of crude now going into storage. The rate of crude oil consumption, however, may not be considered to be as great in the last three months of the year as it is in other periods; and especially at a time when it will be desirable for the purchasing companies to have their tanks as nearly full of crude as possible for inventory purposes at the end of the year.

After Jan. 1, when a number of crude oil contracts covering tanker shipments shall have been completed the intercoastal movement through the Panama Canal will be readjusted to a new statistical basis. An average of 100,000 barrls daily is called for in 1924 tanker contracts so far as they have been possible to measure.

Future Estimates for Basin

Estimated production, Jan. 1. of 735,000 barrels daily contemplates only nominal declines in the older of the exploited fields and it accredits to the larger and more potent development areas of the Los Angeles basin, the following daily averages:

Field	Barrels
Santa Fe Springs	220,000
Long Beach	210,000
Huntington Beach	72,000
Torrance-Redondo	40,000
Total	542,000

Wtih the exception of certain shut-in production being currently opened up in the Coalinga heavy oil field at the north end of San Joaquin valley development, it is improbable that any considerable number of wells now closed down will be reopened until after the close of the year.

Estimated shut-in production, however, does exceed 100,000 barrels daily, amounting to roughly 72,500 barrels in the older San Joaquin valley fields and roundly 30,000 barrels in the Los Angeles basin. Only Huntington Beach of the currently most important southern California fields is accredited with any shut-in production; and the quantity totals 3000 barrels daily. Santa Fe Springs and Long Beach are credited with producing to the capacity of all wells.

As the writer has previously pointed out, most operators in California are agreed that the peak has been reached, if not passed, at Santa Fe Springs; and Huntington Beach is definitely on the down grade. Regarding Long Beach, many operators differ, but in comparison with Oct. 4 production of 258,605 barrels daily it is accredited in future estimates with roundly 210,000 barrels Jan. 1.

Week-to-Week Production

Daily production figures for the four currently most important Los Angeles basin fields for the last 10 weeks are shown for comparative purposes in the accompanying table:

Santa Fe Springs

Week Ended	Prod. (Barrels)	No. Wells
August 2	332,235	166
August 9	338,866	169
August 16	332,055	179
August 23	341,634	187
August 30	338,013	201
September 6	338,587	199
September 13	327,304	210
September 20	308,622	210
September 27	319,251	221
October 4	291,144	221

Long Beach

August 2	211,585	205
August 9	219,129	209
August 16	229,262	211
August 23	237,609	221
August 30	241,686	223
September 6	253,779	239
September 13	245,528	237
September 20	252,908	245
September 27	246,254	250
October 4	258,605	256

Huntington Beach

August 2	101,564	202
August 9	119,250	208
August 16	113,895	206
August 23	106,608	205
August 30	100,615	200
September 6	98,986	204
September 13	95,397	202
September 20	91,286	206
September 27	88,824	207
October 4	83,273	207

Redondo-Torrance

August 2	6,657	32
August 9	6,568	32
August 16	5,064	27
August 23	6,572	28
August 30	6,143	29
September 6	6,002	30
September 13	6,036	28
September 20	5,941	28
September 27	9,580	30
October 4	12,746	36

The Redondo-Torrance development, which last week had gained in production to the level of nearly 13,000 barrels daily, may be expected to reflect the activities turned in that direction at a time when less attention will be paid to development in the older areas. It is generally believed that an estimated recovery of 40,000 barrels daily, Jan. 1, for Torrance will be nearly doubled when the peak is reached in 1924, the high level of production, probably being around 75,000 barrels daily. Compton, or Dominguez Hill, as it is otherwise known, is ignored in the figures herewith submitted for the reason that a single well producing a maximum of 1338 barrels daily is to date the only production in the field. Although the writer is inclined to value its ultimate yield of crude petroleum as likely to put Compton in a class with Santa Fe Springs or Long Beach as a producing field, he feels entirely satisfied that it will be found out-stripping Huntington Beach.

The time required for Compton's influence to be felt in a major sense (at least six or eight months) plus the controlled character of the bulk of the acreage inclines a student of the situation to consider this field one in which the requirements of the interested producing companies will govern the rate of development. Except for a possible 15 per cent of the field total of productive ground, Compton is in the hands of two of the larger operating companies, the Union Oil Co. of California and the Shell Co. of California.

It is stated that so far as can be seen at the present time there probably will be nothing in the situation in 1924 to cause either of these companies to abandon its existing policy, which is to conserve the resources of the Compton field by developing it as conservatively as lease requirements and company needs permit.

Torrance-Redondo, on the other hand, has a larger number of small plot operators, who are drilling on the equivalent basis of town lot development. Its exploitation over an area of some five to seven miles long, and probably three miles wide, will be pressed with some rapidity. The field, however, is known as an area of 1000-barrel, initial production, wells; in comparison with the earlier Huntington Beach, Santa Fe Springs and Long Beach "gushers," and the Torrance-Redondo area so far has shown only one well good for as much as 2500 barrels daily. A large percentage of the field acreage is in the hands of the Chanslor-Canfield-Midway Oil Co., subsidiary of the Santa Fe railroad, but enough small blocks exist at scattered points in the development, to make for much rapid drilling, especially since the promoter and the one well operator finds the time past for starting new work in the older of the flush fields.

BARTLESVILLE, Okla., Oct. 13.—D A. Campbell, formerly of Danbury, Conn., has been transferred to Bartlesville as industrial fuel engineer of the new business department of the Empire companies. Mr. Campbell first became connected with the Doherty interests in Denver, with the Denver Gas & Electric Co.

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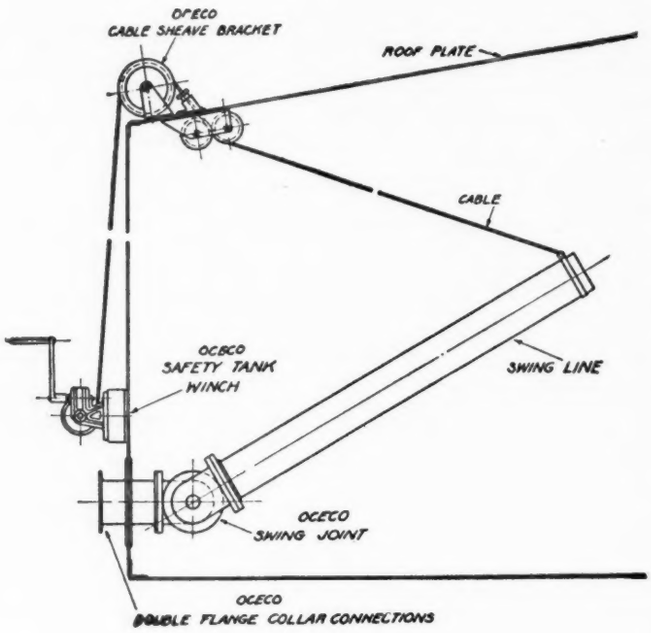

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Production In Shreveport Area Makes Better Showing

SHREVEPORT, Oct. 13.

THE outstanding feature of the oil and gas field activities of the Shreveport territory, embracing Arkansas districts, during the week just ended was the increased number of completions in northeastern Louisiana, strictly a gas area. In Ouachita parish there were seven gassers, compared with two the previous week, and the adjoining parish of Morehouse reported one gasser compared with none the week before.

In the Shreveport territory there were thirty completions, of which nine were gassers, four failures and seventeen producers with combined initial yield 7300 barrels, against the preceding week of 27 completions, including two gassers, 8 failures and 17 producers, yielding 1907 barrels. The initial production was more than four times larger than the week before.

Daily average production also showed a gain, totaling 180,459 barrels, compared with a total of 178,869 barrels the week before.

Only three oil wells were completed in North Louisiana during the week. Two were sma l producers in Caddo parish and the other was a small well in the shallow depth field of Bellevue. In the latter field two water wells, one salt water and one fresh water, in the southwest portion of the area indicated that the field probably cannot be extended farther in that direction unless at a deeper depth than is now producing.

Ten wells were completed in Smackover, which is the lowest ebb to be reached in number of new producers during a week's period since the area was discovered in July, 1922, by the V. K. F. Drilling Co.

By districts the record in the Shreveport territory during the past two weeks was as follows:

SHREVEPORT, Oct. 13.—Daily average production in the Shreveport territory during the week ended October 11 showed an increase of 1,590 barrels over the record of the previous week. By districts the daily average for the weeks ended Oct. 4 and Oct. 11 follows:

Daily average	Oct. 11	Oct. 4
Caddo light	8,519	8,496
Caddo heavy	2,320	2,387
Red River-DeSoto	6,810	6,955
Haynesville	23,765	23,965
Homer	9,510	9,550
Bellevue	7,015	5,711
El Dorado	18,920	18,750
Smackover	100,075	99,855
Stephens	3,525	3,200
Total	180,459	178,869
Increase		1,590

Smackover, Arkansas: this week, 11 producers, yield 7120 barrels; week before, eight producers, yield 1135 barrels, and three failures

Stephens, Arkansas: Three producers, yielding 90 barrels, this week; two producers yielding 77 barrels the week before.

Panola county, Texas: one gasser this week; none week before.

Ouachita parish: seven gassers this week; two gassers week before.

Morehouse parish: one gasser this week; none week before.

Bellevue field, Louisiana: one producer, 25 barrels, and three failures this week; three producers, yielding 234 barrels, and four failures the previous week.

Bossier parish, outside of Bellevue; one failure this week; no completions the week before.

Caddo parish: two producers yielding 65 barrels this week; one producer yielding 40 barrels and one failure the week before.

El Dorado, Arkansas: no completion this week; two producers yielding 275 barrels the week before.

Haynesville: no completion either week.

Red River, De Soto: No completion either week.

Nevada county, Arkansas: no completion this week; one producer, 150 barrels, the week before.

Completions in North Louisiana and Arkansas Week Ended Oct. 11

LOUISIANA

Caddo

Company	Well	Location	Depth	Yield
Fortuna Oil Co.	Raines No. 19	18-22-11	1610	15
Muslow Oil Co.	Brown Fee No. 1	31-21-15	1590	50
Bossier Parish				
Triangle Drilling Co.	Bolinger No. 1	18-22-11	2867	s. w. aband.
Bossier—Bellevue				
Bliss & Weatherbee	Fee B-3	15-19-11	441	fresh water aband.
Humble O. & R. Co.	Roy B. & W. No. 16	15-19-11	501	s. w. aband.
La. Oil & Ref. Corp.	Fee D-25	15-19-11	375	25
Pope et al.	Catlett No. 1	27-19-11	302	s. w. aband.
Morehouse Parish				
Ladell et al.	Fee No. 15	23-20-5E	2280	3 m. ft. gas
Ouachita Parish				
Maury Drilling Co.	McEwen No. 2	20-19-4E	2180	10 m. ft. gas
Florsheim et al.	Richie No. 1	32-19-5E	2215	25 m. ft. gas
A. D. Hosterman	Stubbs No. 2	28-19-5E	2235	10 m. ft. gas
Monroe, La. Carbon Co.	Hancock No. 1	28-19-5E	2220	5 m. ft. gas
Palmer Corp.	Morgan No. 1	21-19-5E	2240	15 m. ft. gas
Texas Oil Co.	O'Neal No. 2	33-19-5E	2215	7 m. ft. gas
Union Gas & Prod. Co.	Doughtie No. 3	28-19-5E	2215	15 m. ft. gas
TEXAS				
Panola County				
Magnolia Pet. Co.	Steele No. 4	B.C.Jordan H.R.S.	1937	25 m. ft. gas
ARKANSAS				
Stephens				
Hude & Aarnes	Brown No. 4	13-15-20	2090	40
Ohio Oil Co.	Tidwell No. 6	20-15-19	2165	15
Standard Oil Co.	Milner No. 8	24-15-20	2155	35
Smackover				
Sun Oil Co.	Hardin No. 3	27-15-16	2035	75
Amerada Pet. Co.	Lyell No. 4	3-16-15	1985	1,600
Gulf Ref. Co.	G. E. Murphy No. 2	8-16-15	1980	15
Broderick & Calvert	Murphy No. 3	8-16-15	2060	200
J. E. Crosby, trustee	Murphy No 2	15-16-15	2080	700
Gladys-Belle Oil Co.	Thomson No. 7	7-16-15	2080	150
Imperial Oil Co.	C. Bank No. 1	12-17-15	2150	15
Humble O. & R. Co.	B. Goodwin No. 1	3-16-15	1990	2,000
Monarch Oil Co.	Harrell No. 1	17-16-15	2125	2,000
Page et al.	Murphy No. 3	15-16-15	2056	300
Quaker City Pet. Co.	Polk & Ezell No. 2	11-17-15	2200	25

Ask Gusher Guarantor Be Adjudged Bankrupt

SHREVEPORT, Oct. 13.—Harry N. Morris, a Shreveport oil promoter, also known in the El Dorado area, has been made defendant individually and as sole trustee of the Harry Morris Guaranteed Gusher Syndicate No. 3 in an involuntary bankruptcy proceeding filed in the federal district court here this week by E. J. Sandford, C. C. Sherwood and O. F. Hicks. The petitioners claim that the defendant is insolvent.

The plaintiffs also claim that Morris removed the books of the company from his office in El Dorado from which he conducted the business of the concern, and concealed them, although they contained the accounts and records of the company. This, it is charged, was done to hinder, delay and defraud his creditors.

The petition also recites that on or about Aug. 29, 1923, H. L. Williford, was appointed receiver for the syndicate by the chancery court of Union county, Arkansas, because of insolvency, and that he is now in charge of the affairs of Harry N. Morris under the laws of the state of Arkansas.

Montague Gasser Is Wild

FORT WORTH, Oct. 13.—The Humphreys Oil Co.'s No. 6 Maddox, Montague county gas field, has broken loose, after having been under control several months, and is now running wild, according to reports from the field. This was one of the largest gassers in the Montague county field, and much difficulty was experienced in getting it under control when it was drilled in.

SHREVEPORT, Oct. 13. — Among the feature exhibits at the eigtheenth annual State Fair of Louisiana, which will open here Oct. 18, and run eleven days, will be one pertaining to the minerals of the state. Oil will occupy a prominent place in the exhibit, according to advices received by the State Fair management from the Louisiana Department of Conservation, which will place the exhibit and have representatives in charge to answer questions.

New Prices Are Expected To Bring Disaster To Small Producers

By Special Correspondent

LOS ANGELES, Oct. 11

THE unexpected has happened. There were several times, during the summer months, when the oil producers of southern California were all set for a price cut. They even went so far as to fix up their affairs at the bank and make their wills, and yet the expected cut did not come, probably because the Southern California Oil Producers committee had the pipe line prorata campaign so well in hand.

And now, after the committee has closed up shop, and the pinch-down of big producing wells has been lifted, the price of California crude takes a big slump. The cut was first announced by the Standard Oil Co. of California on Oct. 9 and later the same day the Union Oil Co. of California and the Independent Oil Producers Agency made it known that they would meet the cut.

The drop ranges all the way from 2 to 28 cents per barrel, the biggest slash being in the price of Southern California's light crude, the majority of which comes from Santa Fe Springs. The cut starts with a 2 cent differential on 22 degree gravity and moves gradually up to 35 gravity crude, where the differential between the new and the old price is 28 cents, the new price being 76 cents and the old price $1.04. On 30 degree gravity the new price is 71 cents against the former price of 89 cents a barrel.

Southern California oil operators anticipate that the price cut will result in financial disaster for a large number of small producers who have drilled from one to five wells and have been depending upon the oil from their wells to pay out on their drilling jobs, all of which have been expensive, because of the great depths of the best sands in southern California.

The price cut will not seriously hit the San Joaquin Valley oil fields, because many wells in that section of the state have been shut in since early spring, because of flush production in the Los Angeles Basin. Only last week the Associated Oil Co. announced the closing down, for a period of four to six months, of 479 wells in the Kern River oil field. These wells have been yielding about 230,100 barrels per month. The company declared that it was shutting them in to afford relief to congested tank farms and pipe lines.

There is no doubting the fact that a great deal of crude will be sold during the coming month at bargain prices. Many of the operators are in such financial straits that they will be obliged to sell for whatever the market will allow them, but those who are not compelled to sell will store it, where storage is available, or keep it in the ground, which is what they were advised to do many times, earlier in the year.

Developments in the three fields which have held attention of the oil interests in the west all this year are slowing down to a marked degree. Santa Fe Springs has perhaps experienced the biggest slump. No less than 10 so-called outpost wells, calculated to extend the area of the field by several hundred acres, have lately been abandoned by the promoters who launched them.

California Daily Production

LOS ANGELES, Oct. 13.—Daily production in California for the week ended Oct. 13 declined 27,050 barrels. Estimates for the two past weeks were as follows:

	Oct. 13	Oct. 6
Santa Fe Springs	295,000	320,000
Long Beach	250 000	245.000
Huntington Beach	80.000	85.000
Torrance	13,000	10,000
Compton	1,250	1.300
Rest of state	198,000	203,000
Totals	837,250	864,300

Big Fellows Drilling

Drilling at that place has dropped off until it is now being done largely by the biggest companies in the state. Last week the field completed four new wells, ranging in production between 1000 and 5000 barrels.

The Huntington Beach field, which apparently saw its peak the week of April 6 when its daily production was 131,884 barrels, has dropped down to 89,000 barrels and is expected to continue its decline for some weeks to come before reaching a stage of settled production. Its new wells are falling in the 300 and 400 barrel class. Last week it completed no new producers.

Long Beach, with its world famous deep sands, is still the bright spot of the Los Angeles Basin. The field completed seven new wells last week and added 11,500 barrels to its daily output, holding its daily yield even with that of the previous week, while Santa Fe Springs dropped 5000 barrels a day and Huntington Beach lost the same amount.

Torrance on the Climb

The Torrance field has climbed up to 10,000 barrels per day, and reports are to the effect that if all its producers were flowing at the same time it could turn out 12 800 barrels daily. A goodly number of new wells are expected to be placed on production in this field within the next two or three weeks, and during November, it is expected, perhaps as many as 20 new wells will be added to the production list.

A good share of the oil activity in the San Joaquin Valley is centering just now around the Hovey Hills, near Taft. On 35-32-23 the Kendo Petroleum Co. has its No. 1 on production and is rigging up its No. 2. Just west of this property the Bell-Evans Syndicate is down 385 feet with its No. 1 well, and is preparing to drill its No. 2. A little farther west, the Vivian B. Oil Co. is preparing to spud in its No. 5. Its No. 4 which came in two weeks ago is doing around 125 barrels a day, at 970 feet.

On the Big Ten property the Berry interests are completing the No. 3 well at 1200 feet. The Formax Co. is grading for No. 9 and No. 10.

Magnolia Petroleum Co.'s Pipe Line Runs

HOUSTON, October 12.—The Magnolia Petroleum Co., pipeline department, announces from Dallas headquarters the following crude oil runs for September, which are shown in comparison with August:

	August	September
Hewitt	38,731.52	32,728.34
Healdton	384,246.23	326,345.15
Cushing	107,300.38	124,427.99
Yale	56,840.41	57,441.17
Cement	37,485.93	33,324.72
Duncan	74,455.16	75,946.04
Augusta, Kans	39,329.50	36,247.38
Walters-Beaver Creek	17,090.85	15,043.85
Bristow	60,303.85	47,735.54
Burbank	96,888.65	37,339.35
Total Okla.-Kans.	912,672.48	786,579.53
Mexia	141,861.43	133,972.26
Thrall	2,243.29	1,739.92
Electra-Burkburnett	221,472.57	247,381.03
Henrietta	7,896.03	8,179.46
Corsicana Heavy	10,715.32	23,146.25
Corsicana Light	888,249.20	1,094,395.41
Comanche (Desdemona)	70,806.72	64,350.33
Olden (Ranger)	20,995.86	28,525.77
Stephens County	47,335.73	42,314.34
Coleman County	476.25	330.31
Mirando	38,423.74	35,893.35
Luling	80,528.20	181,070.47
Total Texas	1,531,004.34	1,861,298.90
Haynesville	16,400.98	14,502.48
Bull Bayou	25,164.16	24,169.52
Total Louisiana	41,565.14	38,672.00
Union County	9,727.69	7,698.56
Eldorado Light	.....	3,711.44
East Eldorado	.....	8,483.99
Total Arkansas	9,797.69	19,893.99
GRAND TOTAL	2,494,969.65	2,706,444.42

CHICAGO, Oct. 13.—Governor W. H. McMasters of South Dakota has announced himself aspirant for the Republican nomination as candidate for United States senator. It is the same Gov. McMaster whose entry into the oil business precipitated the 6.6-cent cut in the tank wagon price of gasoline throughout Standard of Indiana territory in August.

Gulf Coastal, Texas Completions Week Ending Oct. 13, 1923

Company	Lease—Well	Field	Depth	Prod.
Gulf Production Co	Winfree Fee 5	Orange	4277	1019
Sinclair Oil & Gas Co	Granger 5	Orange	3398	144
Mutual Oil Co	Chesson 6	Orange	3075	Aband.
Republic Production Co	Dolbear 19	Hull	1516	200
Republic Production Co	Dolbear 20	Hull	2725	50
Yount Lee Oil Co	Taylor Fee 2	Hull	3015	2500
Sun Company	Carr 9	Hull	1200	100
				85% water
Humble Oil & Refining Co	T. & W. 6	West Columbia	2825	25
Sun Oil Co	Robertson 2	West Columbia	3415	Aband.
R. N. Hines et al	Martin 7	Evangeline, La	1625	20

Townsite Man In Salt Creek Fails To Get Further Hearing

WASHINGTON, Oct. 13

UNLESS Louis P. Lavoye is more successful in the courts than he has been with Secretary Work, of the Department of the Interior, it looks as though the town of Lavoye, in the Salt Creek field named for the homesteader, will be compelled to move. This town has something like 800 inhabitants, several stores, pool halls, dance halls and garages and post office.

Acting upon precedents established by departmental and court decisions, the Secretary of the Interior refused to reopen the case of Lavoye whose homestead entry was cancelled by Former Secretary Fall while in office. The cancellation was made upon petition by the Ohio Oil Co. which was operating the tract and contended that the establishment of the town was interfering with such operation.

Fall cancelled the entry on the ground that at the time Lavoye applied for and obtained the land. which is the southwest quarter of 1-39-79, it was not vacant land but was in the possession of a mineral claimant under right and color of title and had a producing oil well on it.

"Similar action," says a press notice issued by the Department of the Interior, "will be taken by the department on several other like claims in the vicinity.

"Lavoye has not used the lands as a farm, but erected a number of temporary buildings, which he has rented for pool hall. dance hall, stores, etc., and the rentals he has received have more than compensated him for the time and expenditures on the land. The use and occupation of the land by Lavoye interfere with the development of the oil and gas resources, thereby reducing the royalties to the state and government and in addition ample town-site facilities are to be provided within a short distance of the land by the North and South Railroad, a line now being built from Casper, Wyo., into Montana, at which town arrangements have been made for postal facilities, light, water, gas and all other necessary conveniences to those desiring to build houses and conduct business enterprises in the locality."

* * *

CASPER, Oct. 15.—Floyd E. Pendell, attorney for Louis P. Lavoye, and practically all the other homestead entrymen in the Salt Creek field, says that he has already drawn up legal papers for the filing of mandamus suit in the District of Columbia to compel the Secretary of the Interior to reinstate the applicant Lavoye and issue him a patent to the land involved.

The Lavoye case has attracted considerable interest in this state, and this has been heightened by the prospect of the town's having to move out. Such a development would doubtless increase the population of the new town of Salt Creek, founded by the Haskell interests, which is three miles from Lavoye.

Lavoye is a naturalized citizen, having been born in Canada. On Jan. 5, 1920 he filed on the quarter section in question and his claim was allowed by the land office at Douglas on Jan. 28 of the same year. Thus his filing was accepted and allowed prior to the passage of the general land leasing act, Feb. 20, 1920.

The oil and gas lease was originally issued to the New York Oil Co. and has come down to the Ohio Oil Co. and the Boston-Wyoming Oil Co. The Ohio protested the occupancy of Lavoye and alleged that the land was valueless for agriculture.

CASPER, Oct. 13.—Daily average production in Wyoming and Montana fell away off the past week, due to flood conditions in Salt Creek which interfered with pipe line runs. The estimated daily average was as follows:

	Oct. 13	Oct. 6
Salt Creek	51,000	99,000
Teapot	4,540	4,200
Big Muddy	3,800	4,250
Lance Creek	450	460
Pilot Butte	85	90
Lander	375	385
Lost Soldier	5,000	4,900
Rock River	3,800	3,875
Grass Creek	4,700	4,825
Hamilton Dome	515	500
Elk Basin	1,900	1,910
Notches Dome	240	415
Greybull, etc	155	180
Osage	750	945
Ferris	110	130
Cat Creek	5,225	5,360
Kevin-Sunburst	1,540	3,580
Miscellaneous	600	575
Total	84,785	135,580

Light Oil Field Show In South Wyoming

CASPER, Oct. 13.—Another light oil field, covering a relatively small area, appears to be in the making at Rex Lake, 20 miles west of Laramie. The Ohio Oil Co., drilling in 26-16-77, found a sand at 3754 feet and while running the bailer oil started to rise in the hole. The bailer was lost and at the end of the week the crew was trying to drill it up. Oil was then standing in the hole about 700 feet and there was considerable gas.

Although this field would not exceed 2000 acres, probably, it would be a valuable thing for the company. The oil is of about the grade produced in the Rock Creek field.

Kasoming Oil Co. (Prairie) completed two good wells in the Lost Soldier field the past week. No. 39 A in 3-26-90 flowed 970 barrels initial and No. 38-A, 11-29-90 flowed 1000 barrels.

Midwest Refining Co., which sustained the greatest damages in the Salt Creek field during the recent floods, is gradually getting the properties back to normal and expects soon to have all traces of the damage done to the pipe lines wiped out. Runs from the field have been cut down radically but aside from the property loss and the expense of putting the properties back into shape, no lasting damage was done.

Final decision is said to have been reached to electrify the Midwest properties in Salt Creek and work will be under way before long. The company has issued no statement on the matter as yet but it is estimated a total outlay of $10,000,000 will be required. This will be a steam turbine, fuel gas installation.

Protests Rate Advance From North Texas

By Special Correspondent

WASHINGTON, Oct. 15.—In the name of the Western Petroleum Refiners Association, Ed. P. Byars, an attorney at Fort Worth, Tex., has asked the Interstate Commerce Commission to suspend item 3090 of supplement No. 19 to Leland's I. C. C. No. 1561, which would otherwise become operative the first of next month.

Suspension was asked on the ground that the supplement will increase rates on refined petroleum from Iowa Park and Electra, Tex., to more than 4,000 destinations in the region east of the Mississippi and south of the Ohio and Potomac rivers and for the further reason that that increase would result in an unlawful preference for the shippers of refined petroleum at other north Texas refining points, such as Fort Worth, Gainesville, Henrietta and Wichita Falls.

The tariff proposes to close the route through Vicksburg served by the St. Louis Southwestern, except at the cost of a combination of rates to and from Vicksburg. Closing of that route, he said would add $112.40 to the cost of sending a 10,000 gallon tank, car from Iowa Park to such representative destinations in the southeast at Birmingham, Atlanta, Nashville, Augusta and Mobile. From Electra the increase to the same destinations on a same sized tank would be $151.80 per car. The proposed rates, in addition to making the big increases in charges per car, would cause the parity between Iowa Park and Electra to disappear.

Just what was in the minds of the railroad traffic men when they first began making efforts to close routes through Vicksburg Byars, if he knew, did not tell the Commission. He called attention however to the fact that in August the Missouri-Kansas-Texas filed a tariff closing its route through Vicksburg. Interested refiners protested and that road withdrew its proposal, without undertaking to justify what it has done. Byars suggested that the railroads did not really know what the effect of their proposals would be.

Will Exhibit Drake Tools

OLEAN, N. Y., Oct. 15.—The most valuable relic in all oildom—the original tools used in drilling the first oil well in the world, the Drake well at Titusville, Pa., in 1859, will be on display at the annual meeting of the New York State Oil Producers' Association at Wellsville, Friday, Oct. 19th. The tools were loaned to the association by Hon. Lewis Emery, of Bradford, Pa. The tools which have been attracting wide attention at the International Petroleum exposition at Tulsa, have been shipped to Wellsville.

Texas Producers Urge Better Oil Courses In Colleges

By Special Correspondent

FORT WORTH, Oct. 13

MORE attention should be paid to practical oil geology and chemistry in the educational institutions of the southwest, where producing and refining make up a large percentage of the total wealth-producing industries.

This was one of the points stressed in the annual meeting of the Texas division of the Mid-Continent Oil & Gas Association, in Fort Worth, Tuesday, Oct. 9.

Chief among the speakers who urged the importance of more general recognition by the universities and colleges of the various branches of the oil industry, in fitting students for their business life, was W. B. Hamilton, a vice president of the association, who is president and acting manager of the Texhoma Oil & Refining Co., of Wichita Falls. Hamilton personally has shown his stand in the matter by the recent endowment of a chair of practical oil geology in the Southern Methodist University, at Dallas.

J. D. Collett, president of the Texas division, also spoke at length favoring this step. The various branches of the oil industry are the heaviest tax-payers in Texas, it was pointed out, and it would be nothing but just that the two large state schools should have the courses which help fit future oil producers, drillers, and refinery chemists, for their life work. Such courses already undertaken by the University of Texas have already aroused great interest among the students so it was stated.

The division meeting was greeted with the Humble and Texas companies announcements of lifting the proration of runs.

The buoyancy of spirit resulting from this announcement, important as a possible forecast of a recovery of the market in the near future, made the meeting one of much more enthusiasm than could have been normally expected, at such a period of "dollar oil" and almost universal shutdowns in the north Texas district.

The annual banquet, which terminated the day's business, was made the same jollification which characterized the launching of the association four years ago. President J. D. Collett was the principal speaker of the evening.

Education of the public, so that it's co-operation may be gained to the end of the general public good, would be made one of the most important undertakings of the oil industry, in the immediate future, President Collett said. A continuation of the chaotic condition of the oil industry in numerous sections of the country at present, may lead to government control, he stated, and that this may be averted, it behooves the thinking members of the oil industry, in all branches, to set about to remedy these conditions. The public may be of great assistance, he stated, if they can be brought to a clear understanding of the problems and difficulties of the industry.

Louis J. Wortham, editorial head of the Fort Worth Star Telegram, also on the evening program, stressed the plea for more thorough courses in the various branches of the oil industry at the state institution. He was also chosen to present President Collett with the association's remembrance, a gold knife and chain.

Walter D. Cline, past president of the Texas division, and Independent operator of Wichita Falls; W. H. Francis, chief counsel for the Magnolia, at Dallas; and Fred L. Chase, of the Lone Star Gas Co., Dallas, were also on the night's program.

The Texas division members made up a special train to the Petroleum Exposition and Congress and the general meeting of the Mid-Continent Oil & Gas Association, at Tulsa.

J. D. Collett will continue as president of the Texas division, being re-elected at this meeting; Other officers are: W. B. Hamilton, Wichita Falls, W. B. Pyron, Fort Worth, R. S. Haseltine, Dallas, and J. C. Wilson, Beaumont, vice presidents; W. M. Massie, Fort Worth, treasurer and Joe D. Laney, Dallas, secretary.

Members of the executive committee are C. C. Cartwright, Joe McCue, Louis J. Wortham, T. B. Hoffer, W. M. Massie, J. R. Penn, H. J. Morlang and W. B. Pron, of Fort Worth; W. D. Cline, C. H. Clark, Roy B. Jones, J. A. Kemp, J. L. McMahon, W. M. Priddy, W. B. Hamilton and G. C. Clint, Long Wood, Wichita Falls; H. L. Brown of Orange, R. L. McGowan of Mexia. W. B. Sutton of Eastland, F. J. Thompson of San Antonio, Breck Walker of Breckenridge, J. M. Weaver of Eastland, W. H. Fuqua of Amarillo, E. E. Townes of Houston, R. M. Putnam and E. S. Graham, of Graham and E. H. Blum, R. A. Crawford, Frank Cullinan, W. H. Francis, Fred M. Lege, Jr., Edward T. Moore, J Edgar Pew, Frank M. Smith and R. S. Haseltine, of Dallas.

California Oil Receipts Average Lower In September

NEW YORK, Oct. 11.—Receipts of California crude and refined oils at the principal Atlantic and Gulf ports for September totaled 5,528,000 barrels, a daily average of 184,267 barrels, compared with 6,564,000 barrels, a daily average of 211,741 barrels for the month of August, according to the American Petroleum Institute.

Receipts at Atlantic and Gulf ports for the week ended Oct. 6 totaled 1,374,000 barrels, a daily average of 196,285 barrels, against 1,964,000 barrels, a daily average of 280,571 barrels for the week ended Sept. 29. Amounts in barrels are:

	Total Month of Sept.	Total Month of Aug.	Week ended Oct. 6	Week ended Sept. 29
At Atlantic Coast Ports				
Baltimore	1,028,000	514,000	248,000	340,000
Boston	237,000	229,000	.....	160,000
New York	2,433,000	3,049,000	420,000	1,064,000
Philadelphia	470,000	987,000	248,000	155,000
Others	535,000	675,000	215,000	150,000
Total	4,703,000	5,454,000	1,131,000	1,869,000
Daily average	156,767	175,935	161,571	267,000
At Gulf Coast Ports				
New Orleans and Baton Rouge	825,000	970,000	243,000	95,000
Port Arthur and Sabine district	.....	140,000	.....	.....
Total	825,000	1,110,000	243,000	95,000
Daily average	27,500	35,806	34,714	13,571
Total Atlantic and Gulf Coast Ports	5,528,000	6,564,000	1,374,000	1,964,000
Daily average	184,267	211,741	196,285	280,571

Imports of Petroleum at Principal United States Ports

According to figures collected by the Institute, imports of petroleum (crude and refined oils) at the principal ports for the month of September totaled 6,844,000 barrels, a daily average of 228,133 barrels compared with 7,736,000 barrels, a daily average of 249,548 barrels for the month of August.

Imports of the principal United States ports for the week ended Oct. 6 totaled 1,681,000 barrels, a daily average of 240,143 barrels, compared with 1,667,000 barrels, a daily average of 240,143 barrels, compared with 1,667,000 barrels, a daily average of 238,143 barrels for the week ended Sept. 29. Amounts in barrels are:

	Total Month of Sept.	Total Month of Aug.	Week ended Oct. 6	Week ended Sept. 29
At Atlantic Coast Ports				
Baltimore	263,000	430,000	112,000	30,000
Boston	435,000	395,000	41,000	136,000
New York	1,436,000	1,659,000	286,000	370,000
Philadelphia	490,000	456,000	232,000	111,000
Others	801,000	878,000	400,000	191,000
Total	3,525,000	3,818,000	1,071,000	838,000
Daily average	117,500	123,161	153,000	119,714
At Gulf Coast Ports				
Galveston district	1,393,000	1,499,000	208,000	466,000
New Orleans and Baton Rouge	1,217,000	1,179,000	268,000	268,000
Port Arthur and Sabine district	547,000	1,038,000	134,000	75,000
Tampa	162,000	202,000	.....	20,000
Total	3,319,000	3,918,000	610,000	829,000
Daily average	110,633	126,387	87,143	118,429
At All U. S. Ports				
Total	6,844,000	7,736,000	1,681,000	1,667,000
Daily average	228,133	249,548	240,143	238,143

Assigned Car Case Reopened For Hearing Oct. 22

By Special Corespondent
Washington, Oct. 15.

THE Interstate Commerce Commission has yielded to the owners of private cars in the so-called assigned car case to the extent of reopening it for further hearing Oct. 22. The hearing will be had before Commissioner Aitchison, who wrote the report saying that owners of coal cars might not send them, in times of car shortage, to mines where they wished them to go, in excess of the pro rata share of all mines, such pro rata computation to include the privately owned cars.

The oil industry as yet has only an indirect interest but no one knows how soon it may become direct through inclusion of tank cars in the order.

The order forbidding the assignment of private cars to specified mines was made June 13. Every day or two since that time the regulating body has been receiving a printed brief alleging, first that the private car owner did not have an opportunity to be heard at the original hearing because the attack, made by the National Coal Association, was against railroad-owned cars assigned to particular mines for hauling coal for use in railroad engines, and a second because when a witness for private car owners undertook to tell facts he thought important, Mr. Aitchison stopped him with a declaration that he could cut out testimony of that kind because it was merely A, B, C business stuff.

In their briefs, private car owners contended that, by indirection, the regulating body was doing what it had asked congress to do, namely, abolish private cars, and which congress had declined to do. Clifford H. Browder, attorney for the International Harvester Co., in his brief in behalf of his client, pointed to a bit of legislation, written into the Interstate Commerce Act in 1920 by Representative Howard of Oklahoma, who was acting on the suggestion of owners of tank cars. The transportation bill, as introduced, authorized the commission, in time of car shortage to make service orders covering cars "regardless of ownership." In other words, the proposed law would have given the commission control in times of car shortage, over the cars owned by the oil industry.

At the request of owners of tank cars Mr. Howard offered an amendment so as to make the bill read "regardless of ownership, as between carriers." Those words "as between carriers" made it certain that congress was not intending to include private cars within the scope of the orders that might be issued.

Browder made the point, which was overlooked by the writer, although he was closely in touch with the offering of the Howard amendment, that in making the order in the assigned car case, the commission ignored the limitation "as between carriers" in so far as private cars used for carrying coal were concerned.

Such ignoring of the Howard limitation it is suggested, makes the order of the commission in the assigned car case much more of a menace to the oil industry that was pointed out at the time the story of the commission's order, written from the point of view that took in the oil industry's tank car, was prepared.

Unless the commission reverse itself on the private car part of the order, or the courts enjoin, the order will stand as a menace to the millions the oil industry has invested in its 135,000 tank cars. The law, as construed, will apply to private cars used for carrying coal. There will then be no barrier between the order and the private tank car of the oil industry, other than the inclination of the regulating body. After holding a hearing it could decree that private tank cars could not be transported by the railroads beyond the pro rata share of each refinery, simply because the railroads had failed and neglected to buy tank cars enough to serve the maximum needs of the oil industry.

No representative of the oil industry attended the hearings on the original hearing because the possibility of the commission disregarding the Howard amendment was not even suspected, much less deemed probable.

Because of the point made by Browder, the industry might well ask to be allowed to intervene in the case to press the point that the Howard amendment was put in at the instigation of owners of oil tank cars which had been bought because the railroads refused to buy and in that way the oil industry had been forced to make investments which it would not otherwise have made.

Therefore it might be suggested that the oil industry was entitled to have the Howard amendment respected, even if only private coal cars were under consideration.

May Open Deep Sand Pool In Carter County

TULSA, Oct. 15.—Humble Oil & Refining Co. has a showing for a well in the northwest part of Carter county, Okla., four miles northwest of Fox and six miles from nearest production in deep sand, indicating that a new pool may be opened. The well is No. 1 Jennings, located in the southwest of the southeast of 28-1s-3w. It now has 2700 feet of oil in the hole from two formations passed through at 3108 to 3127 and 3155 to 3165 feet. They are now drilling ahead at 3237 feet. Humble officials estimate the well to be good for 100 barrels at the present stage of development. Reports are that the Humble has been acquiring additional holdings and royalties in the vicinity. Acreage is closely held for high prices.

Venezuela is not asleep to her opportunities. The government, realizing that the Tulsa exposition provided an excellent moment to inform the oil industry on the petroleum resources of the South American republic, sent Dr. Lucio Baldo, an engineer in the service of the government, all the way from Caracas to meet the oil men. Assisting Dr. Baldo was M. V. Gonzalez, an attorney and citizen of Venezuela, who now lives in New York.

The booth of this country showed maps and photographs of the oil development and a collection of photographs from the collection of Edwin B. Hopkins, geologist of New York. Booklets printed especially for the occasion gave statistical information and history of development and laws pertaining to oil concessions. Owing to limited space a fuller account of the Venezuelan exhibit is withheld until next week.

Texas Co. And Magnolia Meet Humble Cut

DALLAS, Oct. 16.—On Oct. 9 the day following the announcement by the Humble Oil & Refining Co. of a new schedule of prices for Ranger and Burkburnett crude and the lifting of proration, The Texas Co. announced the following reduction in prices it will pay for north Texas and north central Texas crude.

Below 33	$.90
33-39.9	1.10
40 and above	1.25

This is a reduction of 20 cents on 33-39.9 gravity oil and 50 cents on oil of 40 and above.

The company also announced that it stood ready to purchase 100 per cent of the oil offered, giving the producer the option of selling at the new posted price all or any part of his oil now held in storage with the company. The company will absorb storage charges in all cases where such sale is consummated within 10 days from the date of the new schedule.

* * *

DALLAS, Oct. 13.—Effective today the Magnolia Petroleum Co. announced the following new schedule of prices, in Texas where it is buying on gravity basis at the same time offering to purchase all oil offered:

Under 28	$.50
28-30.9	.70
31-32.9	.90
33-39.9	1.10
40 and above	1.25

This also is a reduction of 20 cents on 33-39.9 gravity oil and 50 cents on oil of 40 and above.

Seven Plead Guilty In Stock Frauds

FORT WORTH, Oct. 16.—Seven codefendants of Doc. Cook, indicted on charges of fraudulent oil stock promotions, have pleaded guilty. These were O. L. Ray, Henry O. Stephens and George A. Demontrond who were directly associated with Cook in his offices and Harry Bleam, George Harvey Currier, H. E. Robinson and J. E. Burmeister, promoters of other companies accused of having made fraudulent merger deals with Cook.

Pleas of not guilty were made by Cook, S. E. J. Cox, Thomas O. Turner, Leslie A. McKercher, Fred K. Smith, Beecher S. Henninger, Arthur K Ekman, W. P. Welty, R. L. Maxwell, W. L. Bradish, Edward J. Bowen, Samuel L. Hess, C. W. Steele, Ambroise M. Delcambre and J. S. Rooks.

OIL FIELD SUPPLY TRADE NEWS

Oil Companies Buying Small Pipe More Than Large

By Special Correspondent

PITTSBURGH, Oct. 16

BACKLOGS of tubular goods business together with a fair day to day buying rate maintained in line pipe and casing, are enabling pipe plants to operate practically on a 100 per cent basis. Mahoning valley pipe manufacturers as well as the Pittsburgh makers continue to ship large tonnages of oil country goods to the west and south, although new buying has been somewhat limited of late.

Reports from California indicate that the drilling of oil wells is proceeding at a rate a trifle higher than last year, 1081 wells being the total to Sept. 29, 1923, as against 1042 in the same period last year. In the week ended Sept. 29, 1923, 33 wells were started in California as against 28 in the same week in 1922. From Pennsylvania, Greene county, W. Va., Ohio and Kentucky the chief demand is for the gas pipe sizes of oil country goods, more attention being paid to the production of gas than of oil. More demand is being encountered for the small sizes of pipe, produced on buttweld furnaces, the Youngstown Sheet & Tube Co., putting out one lapweld furnace at Youngstown, O., and one at Zanesville, O., recently. This indicates a lessening demand for large diameter pipe and no sizable inquiries now are current for line pipe, although extensive installations are contemplated for next spring.

Occasional Plate Orders

Occasional plate orders find their way to the steel mills for oil storage tanks, although this branch of plate fabrication necessarily is light right now, during the period of low prices for oil when little or no incentive is offered to stock it. The Western Pipe & Steel Co., however, was awarded six 80,000-barrel tanks, involving 1800 tons by the Associated Oil Co., of California, while the Chicago Bridge & Iron Works, Chicago, was the successful bidder on two 80's and 13 10,000-barrel tanks for the Pan American Petroleum & Transport Co., for erection at Watson, Cal. This lot involved approximately 5000 tons. The Producers & Refiners' Corp., placed two 55's for Oklahoma installation, with an unnamed fabricator requiring about 300 tons of steel apiece.

Prices on plates show strength in the Pittsburgh territory, 2.50 cents base Pittsburgh being firm, although some competition in the east has developed a 2.40 cent base Pittsburgh figure. In Philadelphia 2.50 cents, Pittsburgh is the accepted market level, equivalent to 2.82 cents delivered Philadelphia, the 2.40 cent base Pittsburgh price being reserved for attractive tonnages which are rare at the present time. The same thing applies in New York, where 2.50 cents base Pittsburgh is equivalent to 2.74 cents delivered.

One Car Order Placed

The record of tank car orders for the week just ended shows but one real order. This called for 100 50-ton tank cars, 10,000-gallon capacity placed by the Mexican Petroleum Corp., with the American Car & Foundry Co.

Some of the oil companies are showing considerable interest in tin plate for their requirements for next year or for the first quarter of next year. A few are endeavoring to make tonnage reservations but until the price is settled upon for that period, no actual orders will be accepted. This price will not be announced for another week or two. In the meantime the tin plate market is unusually firm at $5.50 per base box, 100 pounds, Pittsburgh. Some tin plate is required for Japanese oil companies, spasmodic purchases being conducted by the Nippon Oil Co., and others, although latterly a great deal of this business has been placed in England.

Equipment inquiries are few and far between. Occasional orders are placed and occasional inquiries come out. Among those being received recently are the following:

Orders And Inquiries For Equipment

Steam power house equipment, a generator, etc., together with a new gas generating plant to cost $1,500,000 is wanted by the Consolidated Gas Co. 130 East Fifteenth street, New York.

Machinery, electric power plant and steam boiler plant equipment, a coal tipple, refinery machinery, stills, etc., to the extent of $200,000 will be purchased by the Penn-American Refining Co., Oil City, Pa.

The Madison Oil & Coal Co., Westheimer building, Houston, Tex., is planning the construction of a coal tipple and power plant at its properties near Calvert, Tex., and the installation of mine cars and other equipment.

Equipment for a $150,000 plant, shortly will be required by the Southern Arkansas Oil Co., Pine Bluff, Ark., which recently was organized with a capital of $1,000,000. Frank P. Tomlinson is president.

Machinery for a distributing plant at Fresno, Cal., to cost $200,000 will be bought by the Richfield Oil Co., Los Angeles. C. M. Fuller is president.

Oil well tools and supplies are to be manufactured by the Craig Oil Tool Co., with office and plant at Mendocino and Water streets Long Beach, Cal. Machinery will be required. It has been organized with a capital stock of $100,000; J. F. Craig is president; W. W. Cole is vice president and general manager and L. D. Gardiner is secretary-treasurer.

Varied Equipment Shown In Electrical Test

TULSA, Oct. 13.—Among the exhibits that drew the crowds was the Dye & Cornell well, known as No. 1 Hen since the other drilling well was called No. 1 Chicken Farm. The No. 1 Hen was located on West Brady street, between Cheyenne and Denver avenues, and hole was made to a depth of about 50 feet. The well was spudded through the asphalt pavement.

This was the only electrically drilled well on the grounds. Power was furnished by the Westinghouse Electric Co. with two-motor equipment. The derrick was steel, 80-foot, supplied by the Rig Equipment Co., of Sand Springs, and made by the O'Brien Steel Construction Co., Washington, Pa., and was erected by D. D. Wurtzburger & Co. Bull wheels were also fabricated by the O'Brien company.

Tools and casing were supplied by the Western Supply Co., the cable was a Broderick & Bascom non-kinking oversize wire line; belt was an Iwana hair belt; Parkersburg Rig & Reel Co. furnished the chain-driven sand reel and the California pattern rig irons and the ratchet for use on the Burns temper screw was supplied by Milo Guthrie. American Steel & Wire Co. supplied the patent spool on the bull-wheel shaft. Well was equipped with a Roller oil saver and the Control Casing Head, supplied by the Oil Well Improvements Co.

* * *

Tulsa Rig & Reel Co. was showing off before company with the equipment of the American Steel Products Co. Fitted out with an American steel derrick; steel bull wheels and pony wheels and a Twin City tractor hoist, the business of hauling up and down a weight of 26,850 pounds was conducted throughout the exposition. A Doreco gas burner, made by the Doherty Research Co., was in use.

HOUSTON, Oct. 12.—Earl Hagy, district reresentative for the Wilson & Willard Manufacturing Co., returned the first of this week from an overland trip through the oil fields in Louisiana, Arkansas and north Texas.

HOUSTON, Oct. 12.—Frank Cavanagh, district representative for the Darling Valve & Manufacturing Co., returned the first of this week from New York and other eastern points. Mr. Cavanagh spent several days in the home office at Williamsport, Pa.

High Fluid Level In Los Angeles Basin Wells To Permit Pumping

By Paul Wagner

STAFF REPRESENTATIVE

LOS ANGELES, Oct. 11

SUCCESSFUL pumping of deep wells in the Los Angeles Basin fields pivots, in the immediate future, upon the fluid level maintained. That this fluid level will stand up in the hole to within 1000 to 1500 feet of the top for a considerable period, is declared by many competent engineers to be their belief.

There are among these men many who insist that fields having the thick productive zones of the character of Long Beach, Santa Fe Springs and Huntington Beach should pump as long as 10 to 12 years before the fluid level is materially lowered in the wells.

If their theories are to be accepted, and they are based upon intimate knowledge of field conditions, then the producing stage at which wells cease to flow will not bring the level of daily average recovery to as low a point as has been indicated by the more generally published conclusions of the lesser number of proponents of radical declines.

The statement that it will be impossible to pump wells in the Los Angeles Basin fields when they cease flowing naturally has been iterated and reiterated often enough to amount to a suspicion of propaganda. Although emanating from only a few quarters in comparison with the wide range of engineering thought probed in the writer's investigation of the study undertaken by competent field men and technologists, it is a fact that the latter have been saying little at a time when others were getting wide publicity for their statements.

In this regard, the public expressions that have already come before the industry have not been unlike impressively developed hypothetical statistics that project future production declines downward to a stage where the California industry would retire again to the scope of a Pacific coast petroleum province almost overnight, so to speak.

An inaccurate picture of the petroleum industry projected eight months ahead on a hypothetical basis would be, undoubtedly, the result of any detailed calculations that failed to draw the finest of distinctions and which did not take account of a very considerable number of uncertain factors.

Such picturizations as the American industry has been given recently have not admitted of the pumping production factor at all; they have pre-supposed that new fields of the type of Compton (Dominguez Hill) and Torrance-Redondo will exert virtually no influence, notwithstanding that either of them may easily reach high marks for 1924 of 75,000 and 50,000 barrels daily, respectively even though not intensively developed.

The question is not one of rapid decline of the three currently most important Los Angeles Basin fields, but rather the ratio of that decline. That it will be rapid enough for production to balance in the latter half of 1924 with consumption plus definitely measured tanker commitments is generally admitted; this, however, with the reservation that should the Compton structure prove to extend further northward than it is now believed it will, there would be opened up a relatively small area of equivalent town-lot drilling, which would upset any estimates otherwise possible to make for Southern California production. Torrance-Redondo, an area where wells generally average 1000 barrels, initial production, is a pool the areal extent of which is much narrower than it is long. Its length, however, extends between five and seven miles; and in a number of places drilling operations are being pushed ahead on small plots that make for the equivalent of town-lot exploitation.

ONE of the most important questions that the industry has been asking is "What will happen to production in the California fields when the gas pressure goes off, when the wells cease to flow naturally?"

Various opinions have been tossed back and forth as to whether present pumping equipment would be able to lift the oil from wells as deep as those in the Los Angeles Basin fields.

Mr. Wagner has made a study of the situation on the ground and he here sets forth the most illuminating article on what may be expected, that has been published so far.

—Editor.

More Deep Well Outfits

It has been pointed out in these columns, that generally 8 to 10 months time is required for a new field in California to be felt in a major sense. Generally speaking, that statement holds true for Compton and such future pools as may be found in the Los Angeles Basin. It is not true, however, of Torrance-Redondo, where 60 or more drilling wells are going ahead and where less time will be required for it to show its possibilites. In general, however, it is well to state the qualification that the possibility of putting a great number of deep well outfits to work more quickly than it was two years ago is a condition now existing. There exist the equipment and the knowledge that came with the development of Long Beach, Santa Fe Springs and Huntington Beach, which two years ago were lacking.

The lessons taught by the grief attendant upon development in Long Beach, Santa Fe Springs and Huntington Beach will afford an operating standard against which to weigh the problems of future deep development in California, and especially such deep-pay fields as may be found in the Los Angeles Basin. To whatever extent, the promotion type operator is active, these efficiency measures will be of relatively small effect; but the operator, large or small, who weighed in the balance would be found a component part of the oil industry itself instead of a "playful producer", will emerge from each of his problems better prepared for the handling of the next.

Thus it is with the pumping problem soon to be faced in the Los Angeles Basin. Some of the operators are pumping cement back of the pipe and reinforcing the string against outside pressure, a measure calculated to at least partially increase the safety factor in wells where long strings of relatively light casing were used. They are also reinforcing in some instances by having a protecting string down to a certain depth, that is to say a second string inside the 10-inch or 8-inch.

Stage Pumping Practical

The aforementioned measures are calculated to minimize the dangers of collapsing casing, which will have to be reckoned with when the fluid levels drop to points where it becomes necessary to pump from the bottom of the hole. A method that has been used successfully, however, will eliminate much of the grief attached to deep well lifting, provided that the quantity of oil recovered in pumping practice will warrant the expense of the installation. This method contemplates the use of the stage pump.

It is of record in California at the present time that stage pumps are being used to lift oil from levels as deep as 4000 feet. The first working barrel is placed at the bottom of the hole and another is spaced about half way up toward the top, to relieve excess pressure on the lower barrel. Both working barrels work on the rods in unison. The ratio is described as being about 1600 pounds pressure on a 4000 foot lift, but the stage pump takes off fully half of that.

Earlier in the history of California development and prior to his taking up duties as supervisor of the mineral division of the Louisiana State Conservation Department, Ben K. Stroud, now of the research department of the National Tube Co., aided in an appraisal made by the Independent Oil Producers Agency. As this work was undertaken in the San Joaquin Valley heavy oil fields at a time when there was no history for guidance, Mr. Stroud and the

men who worked with him had to formulate their own data.

Re-Conditioning Charge Necessary

It was found necessary to set up a re-conditioning charge against all wells, every property in the area studied being penalized according to sand thicknesses and productive depths. Mr. Stroud recalled, for example, that on one of the wells owned at Coalinga by M. L. Requa the re-conditioning charge was more than the original drilling expense. This condition was true in many instances, he said, but the individual case is mentioned as being roughly typical.

Mr. Stroud did not discuss in detail the factors entering into the conditions in the days of Coalinga development, but oil field equipment had not been brought to its present state of efficiency at that time; and, too, the shifting formations underground in certain of the earlier California fields were of themselves of a character to create development problems.

It is no criticism of either the operators or the pipe manufacturers to say that the present development in the Los Angeles Basin fields has been carried on under conditions that make for a measure of grief to be encountered in the later life of producing properties. Under hectic development, such as the town-lot exploiter forced upon the industry at Long Beach, Santa Fe Springs and Huntington Beach, competitive drilling made necessary the utilization of material that was not intended for the strenuous duty imposed upon it.

The operator found it necessary, therefore, in meeting competitive development under existing field conditions; but now, in case of casing collapsing, he has no legitimate right to find fault with the manufacturer.

The manufacturers recommend that casing shall be set with certain factors of safety and tables have been published by them, setting forth proper depths. In one case, it is of record that 5282 feet of 8¼-inch, 36 pound casing, was set in a well in one of the Los Angeles basin fields. A safe depth for this size and weight of casing, on a safety factor of 2, is given by tubular goods manufacturers as 2632 feet. Manufacturers generally recommend a safety factor of 2.5. True, says the operator, "but we pump cement back of the pipe and reinforce the string against outside pressure." Still the question exists about that being the answer to the problem.

Danger of Collapsing Casing

As long as the fluid level stands up to a point within 1000 feet of the top of the hole, it is recognized by technologists and mechanical engineers, casing will not collapse in a pumping well; but when it gets down below a certain depth there comes a danger point and casing is liable to collapse at any time. There have been cases of such collapse coming about even when the fluid level stands up, because a vacuum was created for an instant and that was sufficient to bring about disaster.

Where casing collapses under deep pumping practice such as the Los Angeles Basin fields promise more generally next year, the re-conditioning charge undoubtedly will be expensive. In many cases, it will mean re-drilling wells, in whole or in part. When the smaller operators encounter their second re-drilling job, it is freely predicted, some of them are going to find their cheapest course that of turning back the property to the landowner.

Not only the re-conditioning charge but also the reaction from excess and abnormal royalties paid because of promotion activities are going to be felt even more strenuously. The ratio of profit from the operation of a well, or wells, will have to be figured over and above royalty, labor and general overhead, before the one and two well operator will undertake going very far with re-conditioning. An instance is cited at Signal Hill, where at the present time a certain well pays the royalty and the wages necessary to operate it; the owners getting no profit for themselves and only hoping that someone will buy the property.

The theory is urged that if casing collapses in a well in the intensively drilled town-lot development areas of such fields as Signal Hill, Santa Fe Springs or Huntington Beach, then why not abandon it? In all but the few cases, re-drilling of wells will be possible for only the larger and stronger companies. They may be expected, therefore, as properties eventually come into their hands, to abandon many of the wells so that the oil recovery under pumping conditions of the future probably will be from one well on every three acres, or five acres, accordingly as the situation shapes itself economically. This contrasts with a condition where the flush flowing wells in some parts of the fields were as close together as one to the half acre; and in some instances locations were made as close as 50 feet apart.

Unit Companies Doomed

Within four or five months few unit companies will be able to handle their wells any longer, because of such conditions as the aforementioned. As the bigger companies take the wells over, which it is assumed they will do on their own terms, some way of exploiting about one out of every five is probable. Thus handled, and with proper re-conditioning steps worked out, technical men studying the problems of the future feel the fields of the Los Angeles basin will give up important pumping production for years.

A recently published statement of J. C. Axelson, general manager of the Axelson Machinery Co., Los Angeles, was to the effect that he felt he could say "confidently that when it is possible to drill wells to greater depths than they are now being drilled, we will have equipment ready that will successfully pump them. We have not as yet found a well too deep for us to pump and right at this time we are pumping wells in California that are below 4500 feet."

Mr. Axelson said the only additional cost of pumping deep wells was the the sucker rod and tubing the greater footage of tubing and sucker rods naturally being required. He described pumping equipment as being of the usual type, consisting of steel plunger bottom valve is placed inm Palo- ky barrels with renewable liners; and for the greater depths a plunger bottom valve is placed in the barrel to give three seats and balls instead of two.

Only slightly more fuel for steam is needed, according to Mr. Axelson's statement, as the greater the weight of the sucker and tubing the greater the the counterweight placed on the walking beam.

Ralph Arnold and V. R. Garfias, in United States Bureau of Mines technical paper 70, on the methods of oil recovery in California, described pumps as varying widely in detail of design but those in general use contain the following essential parts:

The working barrel, generally 66 to 84 inches in length, ground to an inside diameter of 1¾ to 3¾ inches, and manufactured of special cast iron or semi-steel, is made to screw on the end of columns of tubing, 2, 2½, 3 or 4 inches in diameter, and rests on the bottom of the well or is suspended with the tubing from the casing by means of a tubing catcher or similar device.

The plunger is a tube made of seamless steel and ground to fit tightly inside the working barrel.

The upper or working valve is screwed to the upper part of the plunger and is made of steel throughout, with reversible seat and ball valve of tool steel.

The lower or standing valve, which fits into a tapered recess at the lower part of the barrel, carries a rod that slides through a plug in the lower end of the hollow plunger and carries a nut on its upper end. This construction allows the valve to remain undisturbed during the ordinary reciprocating movement of the plunger, but permits renewal or replacement without necessitating the removal of the plunger.

The plunger generally is operated by means of steel sucker rods, but in a few types by wire rope or wooden rods. In the fields preceding development of the flush pools of the Los Angeles Basin, California practice had been designed generally to take care of heavier oil production at shallower levels. As Messrs. Arnold and Garfias wrote their bulletin several years in advance of the newer light oil development, it is obvious that the following remarks are reproduced here for the purpose of showing California conditions of the older fields.

"It is estimated that the average life of a steel sucker rod, pumping oil of a gravity of about 0.9655 (15 degrees Be.) and containing some sand, is about two years, although in wells producing very heavy oil and great quantities of sand light rods break almost daily. Most of the rods are 20 feet in length, and the number of screw joints is sometimes reduced by welding together two or three such rods.

"The life of the tubing, at the end of which the pump is placed, varies greatly, but under ordinary conditions it should approximate four years. In some fields producing light oil and no sand tubing has been used for 10 years and is still in good condition. In crooked holes, in which the oil was heavy and carried sand, the tubing has been known to wear out in one year. One of the most important causes of wear on tubing is its repeated removal from the well. Such removal is necessary in certain territories."

Pollard Urges Conservation

Discussing the "Conservation of California's Oil and Gas Reserves" before the Los Angeles meeting of the American Association of Petroleum Geologists, John A. Pollard, formerly of the United States Bureau of Mines, said in part:

"Gas is the element that makes possible a flowing oil well. It is through the pressure and vacuum created in the release of the gas content of the oil sands, when penetrated, that carries and forces the oil to the surface. In the

control of the flowing well there is a fixture that is known in the vernacular of the oil man as a 'bean:' the adjustments of the 'bean' regulate the flow of the liquid and the escape of the gas from the we l. When the gas-head is off, the well is then relegated to the 'pumper' class—this is where the depth of the standing oil well permits such operation.

"Let us for the moment take into consideration the task confronting the operator of a pumper with a depth of from 4500 to 5500 feet. The enormous weight suspended in the production line is incapable of suspension by the rods and must, in consequence, part or stretch. This brings about a condition that has never been successfully handled; sucker rods, or pump rods, stretch to a point where the walking beam will not complete the stroke of the pump."

After personal reminiscenes regarding his activity in the original employment of combination rotary-cable tool equipment in California, and the later development of the mud-laden fluid process of rotary drilling, Mr. Pollard illustrated his remarks by citing these as reasons why "in asking the operator of the present day to reverse his methods, I do not anticipate his open arms, but rather his turned back."

Conserving of Gas With Oil

Mr. Pollard then said the thing he is going to ask the operator to do is "to reverse action, to start at the bottom of the well to further conserve, and not at the top, as is the present method.

"Put the 'bean' on the bottom. Therein, I believe, will be found the solution. Put it down where it belongs. It has been granted that gas is the energy that carries and forces the oil, three, four and five thousand feet to the surface; it is Nature's pump entombed there throughout the ages for that and many additional purposes. The loss in the gas pressure in a five thousand foot we'l means a dead well, for no well has ever been successfully pumped at that great depth. In placing the bean at the bottom it becomes a matter of the bean regulating the gas and not the gas regulating the bean as is now the case. Keep the gas in the sands where it can be released when and in just the exact quantities needed. When the gas is gone, there is no element to generate more—it has been dissipated, spent and lost. There are millions and millions of feet of this precious element escaping into the air every day in the Santa Fe Springs and Signal Hill fields. It has been going on for months. It must be stopped in some manner—and soon. Its loss is the greatest of all losses in such a field, it means there will be hundreds of dead wells in the months to come if something is not done to conserve it at once.

"There will of course be the contention that it is difficult to place the bean at the bottom of the well. It is no more difficult to place it there than it is to place tools in a flowing we'l. It may be accomplished through the use of an Armor head, a tool that is now being used in placing tools in a flowing well. This I have proven through experience in the Texas fields where the bean has been placed at the bottom. In addition to regulating the flow of gas from the sand there is still another benefit to be derived in so p'acing the fixture at the bottom, it reduces the wear of the bean to a very great degree. This is logical in the fact that the velocity gained by the gas in its passage through the production string to the top of the well, in which course it carries with it great quantities of solid matter, increasing with every foot traveled, finally reaching the top of the well, there to tear and cut the metal parts of the head-fixtures; added to this is the vacuum created by the gas escaping into the air, causing an added pull in addition to the natural force of the gas and liquid causing undue strain and wear on the bean. It is not difficult to see how this makes the adjustment of the bean a very difficult one when placed at the point of greatest stress and wear.

"Tests that I have made of the benefits to be derived from the reversing of the bean, prove conclusively that the bottom is the place for it. In this manner it is possible to allow the exact amount of gas needed to create the flow. I have stated that conservation must begin with the operator and so it is seen it must. The bean will never be p'aced on the bottom until the operator places it there. The added work entailed in this procedure is repaid a thousandfold, first in conservation, and second in protection of the wearing parts."

Calif. Crude Shipments Show Decline

LOS ANGELES, Oct. 11.—Petroleum exports from the local harbor for the week ending Oct. 5 amounted to 37 tanker loads, totaling 2,164,049 barrels, or an average of 366,292 barrels per day.

Twenty-one of the tankers carried coastwise shipments, 10 went to Atlantic seaboard points, and six went to foreign ports, including points in Canada, South America and the Orient.

The shipments were 174,126 barrels less than those of the previous week. Following is the record of local tanker shipments from Sept. 29 to Oct. 5 inclusive:

Sept. 29

Bidwell for Philadelphia, 68,450 barrels of crude oil for Sun Oil Co.

Cecil County for Fall River, Mass., 68,450 barrels of crude oil for Struthers & Barry.

R. J. Hanna for Richmond, 62,250 barrels of crude oil for Standard Oil Co.

H. T. Harper for Richmond, 32,500 barrels of crude oil for Standard Oil Co.

Sept. 30

Montebello for Martinez, 74,074 barrels of crude oil for Union Oil Co.

Vancolite for Campana, Chile, 82,325 barrels of crude oil for Imperial Oil Co.

Nora for New York, 100,260 barrels of crude oil for Standard Oil Co.

Oct. 1

Cathwood for Martinez, 76,500 barrels of crude oil for Union Oil Co.

Robert E. Hopkins for Puget Sound, 66,450 barrels of crude oil for Tidewater Oil Co.

Alden Anderson for Avon, 61,425 barrels of crude oil for Associated Oil Co.

La Placentia for Martinez, 74,450 barrels of crude oil for Union Oil Co.

Oct. 2

Frank G. Drum for Avon, 65,500 barrels of crude oil for Standard Oil Co.

Lubrico for Richmond, 66,200 barrels of crude oil for Standard Oil Co.

(Concluded on next page)

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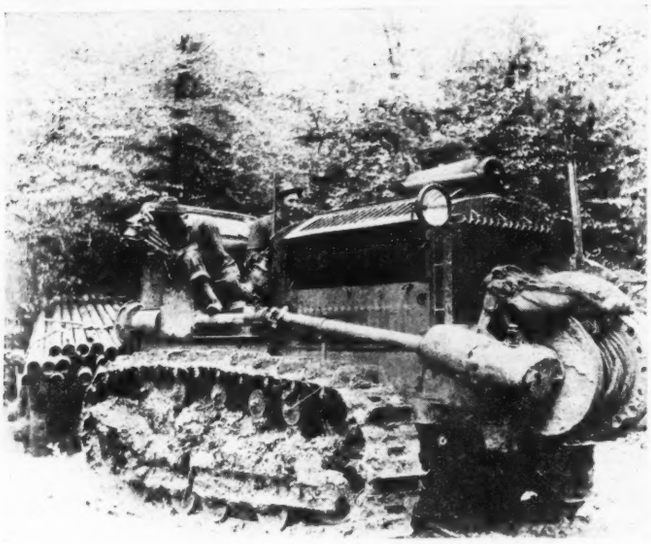

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are described in detail by Messrs. Cox, Dake and Muilenburg in their book entitled FIELD METHODS IN PETROLEUM GEOLOGY.

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Paul Shoup for Avon, 63,000 barrels of crude oil for Standard Oil Co.

Agwihavre for New York, 84,575 barrels of crude oil for Associated Oil Co.

W. S. Miller for Richmond, 61,400 barrels of crude oil for Standard Oil Co.

H. M. Storey for New York, 68,100 barrels of crude oil for Standard Oil Co.

Oct. 3

Cerra Ebano for New York, 95,000 barrels of crude oil for Pan-American Oil Co.

R. J. Hanna for San Francisco, 70,000 barrels of crude oil for the Standard Oil Co.

Lebec for Orient, 70,000 barrels of crude oil for General Petroleum Corp.

Charlie Watson for Eureka, 14,250 barrels of crude oil for Standard Oil Co.

Cuyama (U. S. tanker) for San Diego, 70,000 barrels of crude oil for Navy Department.

Oct. 4

Liebre for Tokuyama, 64,675 barrels of crude oil for General Petroleum Corp.

Trimountain for Puget Sound, 75,000 barrels of fuel oil for General Petroleum Corp.

Hulaco for Avon, 73,100 barrels of crude oil for Associated Oil Co.

Agwibay for Baltimore, 82,000 barrels of crude oil for Associated Oil Co.

Standard for New York, 101,750 barrels of crude oil for Standard Oil Co.

William Green for New Orleans, 57,650 barrels of crude oil for Pan-American Petroleum Co.

Montebello for Martinez, 74,075 barrels of crude oil for Union Oil Co.

Oct. 5

C. T. Dodd for San Francisco, 70,000 barrels of crude oil for Standard Oil Co.

El Lobo for Vancouver, 36,650 barrels of crude oil for Standard Oil Co.

Mojave for Portland, 70,000 barrels of fuel oil for General Petroleum Co.

Cathwood for Oleum, 70,000 barrels of crude oil for Union Oil Co.

Broad Arrow for Orient, 75,000 barrels of crude oil for Standard Oil Co.

Shreveport for Fall River, Mass., 75,000 barrels of crude oil for Associated Oil Co.

Tachee for Kobe, 70,000 barrels of crude oil for Standard Transport Co.

* * *

LOS ANGELES, Oct. 11.—Greater activity in the handling and marketing of southern California crude oil is expected in the near future as a result of the announcement made here a few days ago to the effect that the Union Tank Ship Corp. will shortly put into the oil-carrying trade at this harbor 11 new motor-driven tank ships to ply between Los Angeles harbor and New York, via the Panama Canal.

These tankers, according to Herbert A. Blumenthal, president of the tank ship corporation, will serve as feeders for a great refining concern.

Under the same general plan, the Dominion of California Pipe Line & Storage Co. will build a network of pipe lines in the Signal Hill and Torrance fields, to carry crude to a loading station which it plans to build in the Banning property on Mormon island, at Los Angeles harbor.

High Price Of Hard Coal Helps Oil Burner Business

CLEVELAND, Oct. 11. THE high and mounting price of anthracite coal is causing owners of homes, hotels, office buildings and apartment houses to turn their attention to the possibilities of heating with oil to an extent never before experienced.

This fact is giving the oil companies the best chance they have ever had to co-operate with the oil burner manufacturers in pushing home heating installations and thus making a market for burning distillate which might be developed into a profitable business far more generally than it is now.

New England, one of the most important strongholds of hard coal for domestic heating, is showing great interest in the use of oil. Hard coal has been almost the only domestic fuel used in that region for years. Driven by the high prices that have been getting higher each year, many New Englanders have been burning soft coal but they do not like it. Now they are showing signs of turning to oil as the best way out.

The New England Oil Heating Association, a newly formed organization, held its first meeting at the Boston City club, Boston, Oct. 3. The meeting was attended by 108 oil and burner salesmen. The advantages of oil heating were discussed and the theory held by many unfamiliar with oil that it is a dangerous heating fuel, was combatted.

One of the Boston city officials, present at the meeting told the audience that out of 4500 fire alarms answered by the Boston fire department last year, only 24 were caused by oil burning installations, despite the fact that oil burning devices have been increasing in use for the past two or three years.

The trend of popular thought is reflected in an editorial in the "Boston Traveler," headed, "Greasing the Skids for King Anthracite." The editorial follows:

"Statements made at the opening meeting of the New England Oil Heating Association at the Boston City club the other evening, indicated that the purveyors of oil heating systems look upon themselves as public benefactors and emancipators. Much was said about the greed of the coal interests and to the effect that such greed was destined to bring a just retribution upon the heads of the mine owners and workers.

"Something of that sort is already commencing to happen; and while there is no need to credit the inventors with altruism, they surely have helped to relax the grip of the coal despots. The oil consumed in New England amounted in 1920-21 to 500,000 gallons. Last year the oil consumption had mounted to 4,300,000 gallons, nearly a nine-fold increase.

"Oil may not be the only or the ultimate way out of the hard coal slavery under which this section has suffered so much. A thriving young business in coke has been developed here. Moreover, though our householders do not for the most part take kindly to soft coal, some of them are learning to burn it and there is no telling how soon some inventor will come along with a device for eliminating the smoke and other undesirable features of bituminous and then that underrated fuel will have a chance to become popular.

"Then again, there are the peat bogs existing within a few miles of every New England city and it is only a question of time before peat will be put upon the market at prices advantageous to the consumer. King Anthracite is slipping."

There seems to be a general feeling in New England, as indicated by the editorial quoted, that hard coal prices are beyond all reason and that some substitute for it must be found. If the oil companies and the burner people join forces to sell their products hard enough, oil may beat out bituminous coal and coke and the problematical peat, and become the almost universal substitute.

That at least one oil company, the Standard of New York, is taking advantage of the swing of sentiment toward oil, is shown by advertisements the company is running in the Boston papers. Headed, "No More Ashes," one of the ads reads:

"We mean literally this. Heating whether for the home or public building, is possible without the necessity of ashes and cinders. An oil-burning device is clean-burning and furthermore any degree of heating wished for can be assured and maintained for the entire winter through the automatic control of the thermostat.

"Socony furnace oil is especially refined to meet the requirements of the various oil burning devices now on the market. It is a uniform fuel easily obtained, easily delivered, easily stored. For full particulars inquire at our nearest station."

Increasing interest in oil heating has lately been manifested in New York City where meetings have been attended by householders and building owners and city officials, seeking to iron out the oil storage regulations so as to make possible more widespread use of oil burners.

Finds Refined Benzol Satisfactory Fuel

WASHINGTON, Oct. 11.— Experiments in the operation of internal-combustion engines with motor benzol, conducted by the Departmet of the Interior at the experiemnt station of the Bureau of Mines at Pittsburgh, indicate that this type of fuel may serve as a satisfactory gasoline substitute when refined by the use of sulphuric acid or silica gel, according to a bureau announcement.

The same tests developed the fact that crude motor benzol cannot be used satisfactorily until after the removal of certain compounds which form gummy deposits and eventually stop the engine, the statement says. No engine trouble whatever developed when acid-refined or silica gel refined motor benzol fuel was used. The report goes on to say:

"Motor benzol is a by-product from the destructive distillation of coal. From 1½ to 3 gallons of refined motor benzol is obtained per ton of coal carbonized.

"It is estimated that 6,202,235,000 gallons of gasoline was produced during 1922. The crude light oil output during the same year is estimated at 111,000,000 gallons, or 1.8 per cent of the gasoline production. If all the coal mined were coked in by-product ovens, and the light oil recovered therefrom, this product would amount to only 15 to 20 per cent of the quantity of the petroleum gasoline now produced annually.

"It is obvious therefore, that the light oils by present coking processes can not assume great importance as a gasoline substitute in a national sense. However, the use of light oil as a motor fuel is of real importance in districts adjacent to by-product coking operations from which a reasonable proportion of the local motor fuel supply may be derived. The certainty of diminution of petroleum resources in the relatively near future demands the utmost utilization of gasoline substitutes from the distillation of coal as well as other sources.

"The Bureau of Mines considers that the engine tests made on motor benzol warrant constructive discussion regarding the present specifications which manufacturers of motor-benzol fuels endeavor to meet. Greater emphasis should be placed on the amount of evaporation residue, rather than on certain other present day specifications such as color. It appears also that the initial boiling point might be lowered slightly below 78 degrees C (about 175 F.)"

Poland Has New Plants

WASHINGTON, Oct. 11.—Poland according to reports to the department of commerce, has three new petroleum refinery in the Boryslaw district; the Galicia Petroleum Co. at Braznica; the Silva Plana Co. at Braznica, and a plant of the same company at Boryslaw. The Baku well drilled by the Iriag Co. gave the first production of 105 barrels a day at a depth of 3900 feet. This well is located near Hovodyszcze mountain, the most productive part of the Boryslaw district.

PITTSBURGH, Oct. 11.—Dauler Oil Co. is putting out a handy rate card giving freight tariffs from 4 cents to $1 a hundredweight in the equivalents at 7.4 pounds per gallon and 6.6 pounds per gallon on one side and the capacity of car domes, an outage table and a relative table of Baume gravity, specific gravity and pounds per gallon on the other side.

Do you make a practice of reading the "Oil Industry Exchange" page each week? Don't miss it—you will find a great many interesting items there in every issue.

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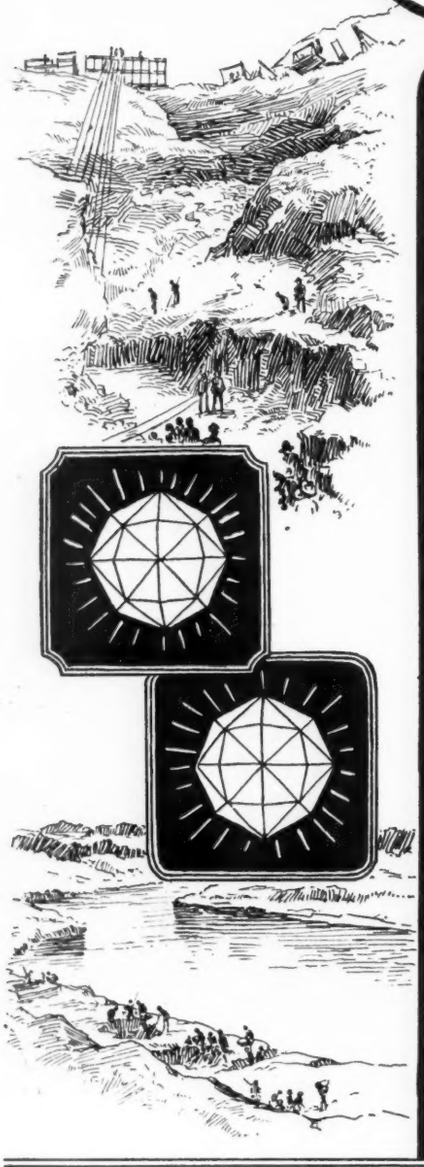
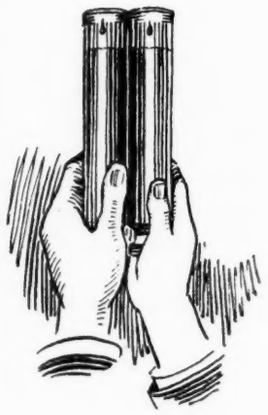


Whether a blue-white diamond—the finest mined—comes from India, Brazil, South Africa, or any other place, it is the SAME in quality as other diamonds of this classification.

This is because ALL "blue-white" diamonds possess certain qualities and conform to certain definite "specfications." In short, a diamond is not considered blue-white merely because it happens to come from a certain locality, but because it IS pure blue-white!

Likewise, it makes no difference where a paraffin base oil comes from. Just so it possesses certain qualities, and meets certain specifications, it is PURE PARAFFIN BASE OIL, regardless of its origin. The growing recognition of this fact is rapidly destroying the "locality" bugaboo in the buying of lubricating oils.

Now, the largest percentage of pure paraffin base oils come from the Mid-Continent Field. Empire Mid-Continent Paraffin Base Oils are selling in large quantities to good jobbers all over the country who demand "specifications," regardless of "locality." Let us send you samples and prices now for comparison.



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Cuban Sugar Mills Use Crude For Oil

WASHINGTON, Oct. 11.—In a report to the department of commerce, Vive Consul James V. Whitfield said that for the year 1922, Matanzas, Cuba, imported 27,675,021 gallons of crude petroleum. All of it with the exception of 14,177 gallons from the United States same from Mexico. During the first six months of 1923 Matanzas imported 32,390,025 gallons of crude, or 4,715,004 gallons more than for all of 1922. Of the quantity imported in 1923, Mexico furnished all but 7,631 gallons, which came from the United States.

The increased importation for 1923 is due primarily to the fact that the higher price obtained for sugar by the sugar mills enabled those mills that last year burned wood, to use oil for fuel during the 1922-1923 grinding season.

The prosperity of the sugar industry was reflected in other consumers of oil, such as the railroads, foundries, and brick mills, and resulted in increased consumption by these industries. Consumption, and consequently importation, of petroleum is heaviest from December to June, as this is the grinding period of the sugar mills.

It is believed that the importation of crude petroleum through this port for the coming year will be as great or greater than for the present year, provided the price of sugar remains sufficiently high that it will not be necessary for the mills to return to wood as a fuel for lack of cash or credit.

LOS ANGELES, Oct. 11.—After 12 years of service as superintendent for the Union Oil Co. of California, in the Ventura district, E. E. Chamberlain has just resigned because of failing health. Mr. Chamberlain first entered the employ of the company back in 1887, as a tool-dresser. After seven years in that capacity he quit and went into other business, but returned to the company in 1912 as superintendent of field operations at Ventura and Santa Paula, Cal. He was superintendent of the Union's pipe line at Ventura.

CASPER, Oct. 11.—F. A. Miller, formerly superintendent of the Ferris lease of the Producers & Refiners Corp., has been appointed district superintendent of all Producers & Refiners Corp. properties in the Lost Soldier district.

LOS ANGELES, Oct. 10.—Fred R. Letcher, for 18 years an oil producer in Oklahoma, has moved here from Tulsa and opened offices at 208 Union Oil building. He has made the location for his first well in the Torrance field at the outskirts of the town.

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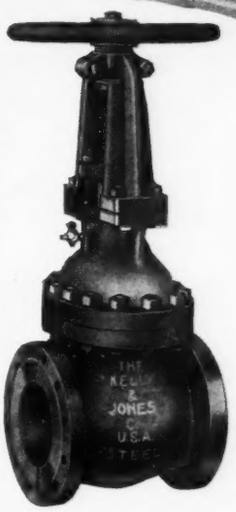

Fig. 1200
Cast Steel Gate Valve for 350 lbs. Superheated Steam Pressure and a temperature of 800°F.

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All castings are made of Electric Steel in our own steel foundry—free from sand holes and shrink holes, and the quality and strength are therefore absolutely guaranteed.

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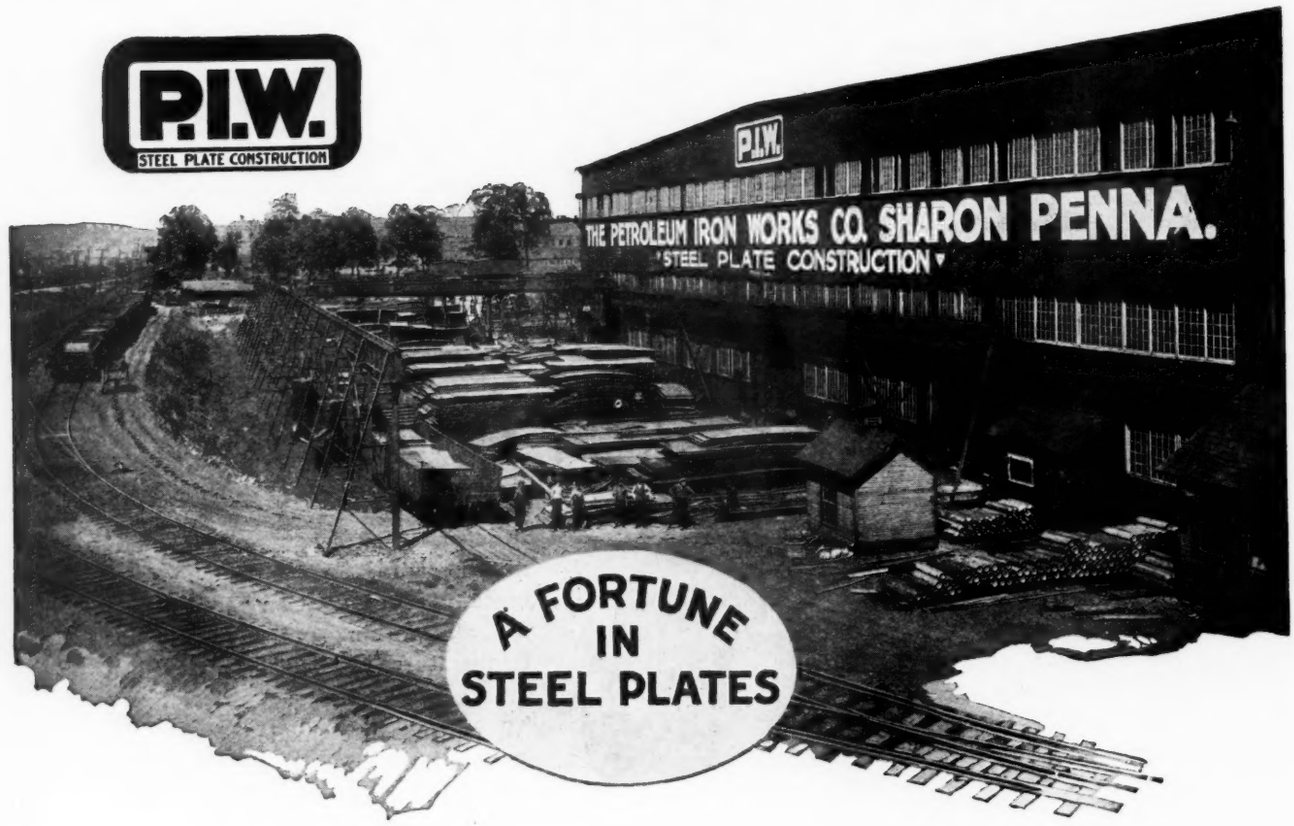

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Oil Patents Issued In September

In Producing Fields

Dehydrator Device

No. 1,467,003, Sept. 4, 1923, Rector E. Land, Houston, Tex., Electrical dehydrator; Class 204, sub-class 24; filed Sept. 28, 1922; assigned to Petroleum Rectifying Co., a corporation of California. 6 Claims.

The underground supply wire to an electric dehydrating tank is led in through a U-shaped bushing filled with transformer oil and closed on the outer leg of the U. Since the dehydrated oil forms in the top of the tank, the danger of water getting into the U-shaped bushing is lessened, as is also the likelihood of the insulator capping the outer leg of the U-shaped bushing being injured by foreign matter in the emulsion under dehydration.

Swivel Rope Socket

No. 1,467,273, Sept. 4, 1923, George Jaques, Casper, Wyo. Swivel rope socket for oil-well-drilling tools. Class 255, Sub-class 26. Filed Sept. 16, 1922. 3 Claims.

A swivel rope socket for oil well drilling tools is arranged to facilitate the rotation of the tool and socket by twisting the cable without longitudinal movement between the swivelled neck and body of the socket. The socket has an externally threaded boss on its upper end over which fits a shell, and a hollow rope receiving stem or neck is held within the shell and has a ball bearing connection between its lower end and upper end of the boss.

Anti-sand Pump Valve

No. 1,467,635 Sept. 11, 1923, Albert T. Hagaman, Louisa, Ky., Oil-Well equipment. Class 103, Sub-class 194. Filed Jan. 29, 1923. 4 claims.

A supplemental valve is provided for an oil well pump on the lower end of the main valve stem, is an enlarged or inactive portion of the inner or working barrel. By drawing up on the main stem the supplemental valve is lifted into active position and the main valve acts as a sand arrester to keep sand off the supplemental valve.

A Barnickel Patent

No. 1,467,831, Sept. 11, 1923, William S. Barnickel, St. Louis. Process for treating petroleum emulsions, Class 196, Sub-class 26. Filed Jan. 4, 1919. Assigned to Wm. S. Barnickel & Co., St. Louis, a corporation of Missouri. 10 claims.

In the treatment of petroleum emulsions to separate the oil and water a mass of the emulsion is subjected to from .01 to 1 per cent of a treating agent such as the esters and aromatic compounds of sulfo-fatty acids, the sulfo-fatty acids, and the salts of such substances. The oil then separates above, the water or brine settling at the bottom.

Separating Under Pressure

No. 1,468,193, Sept. 18, 1923, Lester L. Carter, San Francisco. Gas and water separator for oil wells. Class 196, Subclass 26. Filed Jan. 16, 1922. 4 claims.

In order to avoid the troublesome emulsion resulting from passing the discharge from the well under pressure through a constricted orifice to reduce the pressure, means are provided for separating the oil, water, and gas before the pressure is reduced.

> These abstracts were prepared by a leading patent attorney who is not only thoroughly familiar with the operation and methods of the patent office but also, through wide experience, is particularly well versed in the oil industry division of the patent field.
>
> Copies of letters patent may be obtained from U. S. Patent Office, Washington, D. C., for 10 cents each by giving the serial number of the patent.—Editor

Shale

Conveyor Still

No. 1,468,435 Sept. 18, 1923, John Zander, Chicago. Distillation apparatus. Class 196, Sub-class 19. Filed July 21, 1920. 2 claims.

In a chain conveyor type of shale still, the inlet and outlet for the material are each provided outside the still with a water seal. This results in providing water vapors mixed with heated shale to an extent sufficient to cause the bitumen in the shale to give up a large amount of oils under the action of heat.

Vapor Dehydrates Shale

No. 1,467,757, Sept. 11, 1923, David T. Day, Washington. Process and apparatus for the extraction of hydrocarbon oils from shale. Class 196, Sub-class 21. Filed July 12, 1919. 4 claims.

Fresh shale is fed into a heat insulated chamber and drops into a screw conveyor having heat applied below the same. The vaporized oil travels in reverse direction to the conveyor and rises into the insulated chamber at a temperature of about 300°F where some of the oil and water in the fresh shale are removed by the heat of the vapors.

To Reduce Carbon

No. 1,467,758, Sept. 11, 1923, David T. Day, Washington. Process of producing hydrocarbon materials. Class 196, Sub-class 25. Filed Aug. 22, 1919. 11 claims.

To reduce the formation of carbon in the distillation of shale with cracking, a fresh heavy hydrocarbon oil or tar is mixed with the oil bearing shale and fed into a retort having a temperature from 500°F to 1400°F according to the results desired and under pressure from negative up to 200 pounds. The non-volatile residuum of the oil forms with the shale a dry non-caking mixture:

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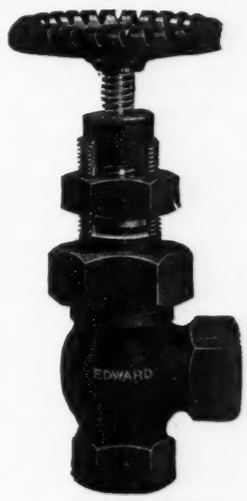

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The meter measures gallon for gallon without taking into consideration changes in volume of liquid due to changes in temperature and in that respect it measures the same as a five-gallon can.

The oil pressure or the gravity head of oil does not affect the accuracy of the meter, but it must be one pound per square inch or more, or a head of two feet or more. These proper conditions may be found at some point in nearly all oil installations, and therefore, Niagara Meters may be used almost anywhere a measurement of oil flowing in a pipe is desired.

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"We would not consider installation of gasoline equipment without checking same with Niagara Meters." The Manufacturers Association of Jamestown, N. Y.

"We are indeed pleased to recommend Niagara gasoline meters." Transcontinental Oil Company

"When we buy more meters, they will be Niagaras, because they are the best." Kokomo Steel & Wire Company

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Tentative Method Of Test For Water In Petroleum Products

(Serial Designation: D 95-23 T)

THIS method of test determines water existing in a sample of bituminous material by distilling the sample with a volatile solvent. This method is suitable for a variety of materials but is especially applicable to petroleum, fuel oil, road oil, coal tar, water-gas tar, cokeoven tar and other petroleum products or bituminous materials.

1. Apparatus

2. The apparatus shall consist of a metal still or glass flask, heated by suitable means and provided with a reflux condenser discharging into a trap connected to the still or flask. The trap serves to collect and measure the condensed water and to return the solvent to the still.

The type of distilling apparatus used is not an essential feature of this method, but glass has been generally used for petroleum products and the metal still for road materials and tars.

3. (a) The metal still (Fig. 1 a) shall be a vertical cylindrical vessel, preferably of copper, having a faced flange at the top to which the head is tightly attached by means of a clamp. The head shall be of metal, preferably of brass or copper, and be provided with a tubulation 1 in. in inside diameter.

(b) The glass flask (Fig. 1 b) shall be of the short neck, roundbottom type, made of well-annealed glass, having an approximate capacity of 500 cc.

4. The burner used with the metal still shall be a ring gas burner 4 in. (100 mm.) in inside diameter. With the glass flask, an ordinary gas burner or electric heater may be used as the source of heat.

5. The condenser shall be of the water-cooled, reflux, glass-tube type, having a condenser jacket not less than 400 mm. (15¾ in.) in length with an inner tube 12 to 16 mm. (½ to ⅝ in.) in diameter. The end of the condenser to be inserted in the trap shall be ground off at an angle of 60 deg.

6. The trap shall be made of well-annealed glass constructed in accordance with Fig. 1 (c) and shall be graduated as shown from 0 to 10 cc. in 0.1 cc. divisions. The error of any indicated capacity shall not be greater than 0.05 cc.

The outside diameters should be preferably 2.5 to 3.5 mm. (3/32 to ⅛ in.) greater than the inside diameters specified.

7. (a) The solvent used when testing petroleum products or bituminous materials derived from petroleum shall be gasoline free from water and shall conform to the following distillation requirements, determined in accordance with the Tentative Method of Test for Distillation of Gasoline, Naptha, Kerosene, and Similar Petroleum Products (Serial Designation: D 86-23 T) of the American Society for Testing Materials:[1]

5 per cent shall distill at a temperature not below 194° F. (90° C.) nor above 212° F. (100° C.)
90 per cent shall distill below 410° F. (210° C.)

(b) The solvent used when testing bituminous materials derived from coal tar, water-gas tar, etc., shall be a coal-tar naphtha or a light oil and shall conform to the following distillation requirements, determined in accordance with the Tentative Method of Test for Distillation of Gasoline, Naphtha, Kerosene, and Similar Petroleum Products (Serial Designation: D 86-23 T) of the American Society for Testing Materials:[1]

98 per cent shall distill between 248° F. (120° C.) and 482° F. (250° C.)

II. Sample

8. The sample shall be thoroughly representative of the material to be tested and the portion of the sample used for the test shall be thoroughly representative of the sample itself. Deviation from this requirement shall not be permitted.

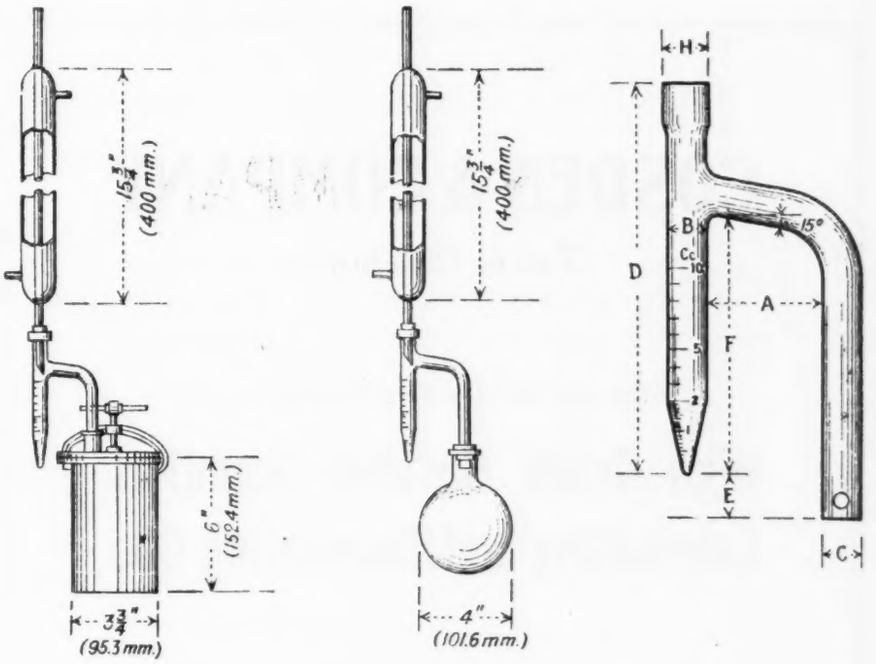
NOTE.—The difficulties in obtaining proper representative samples for this determination are unusually great so that the importance of sampling cannot be too strongly emphasized.

III. Procedure

9. When the sample to be tested contains less than 10 per cent of water, exactly 100 cc. of the material to be tested shall be placed into the still or flask and thoroughly mixed with an equal volume of solvent by swirling, proper care being taken to avoid any loss of material. If the material is measured by volume, an accurate 100-cc. graduated cylinder shall be used and the contents transferred to the still by rinsing with one 50-cc. portion followed by two successive 25-cc. portions of solvent, the cylinder being allowed to drain each time. When the sample to be tested contains more than 10 per cent of water, the volume of material used shall be decreased to that which will yield somewhat less than 10 cc. of water.

NOTE.—In special cases where the water content exceeds 10 per cent and it is not desirable to reduce the size of the sample to that which will yield somewhat less than 10 cc. of water, a distilling tube receiver graduated from 0 to 25 cc. may be used. This tube shall be graduated from 0 to 2 cc. in 0.1 cc., from 2 to 5 cc. in 0.2 cc. and from 5 to 25 cc. in 0.5 cc.

The connections between the still or flask, trap and condenser shall be made by means of tight-fitting corks as shown in Figs. 1 (a) and (b). When



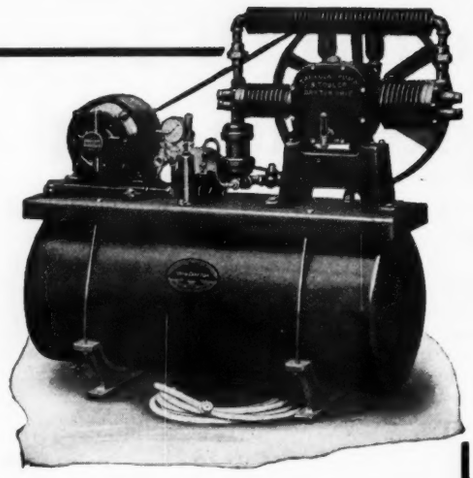
A	45 to 55 mm.	1¾" to 2⅛"
B (Inside Diameter)	14 " 16 mm.	9/16" " 5/8"
C (Inside Diameter)	12 " 16 mm.	½" " 5/8"
D	150 " 170 mm.	6" " 6¾"
E	25 " 38 mm.	1" " 1½"
F	100 " 108 mm.	4" " 4¼"
H	18 " 19 mm.	11/16" " ¾"

(a) (b) (c)

FIG. 1.

Fewer Working Parts—

—Cut First Cost—
The Price
—Take Less Oil—
Less Oil
Fewer Repairs
—Make Quick, Dependable, Efficient Operation



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THE accompanying was accepted as tentative by the American Society for Testing Materials at the summer meeting held at Atlantic City. While it is in tentative form, as it remains for a year, the method is subject to revision and criticism.

Every oil man is invited to study the method and make any suggestion or criticism he may wish. Such suggestions or criticisms may be sent to W. H. Fulweiler, United Gas Improvements Co., 319 Arch St., Philadelphia, or to Dr. Van H. Manning, director of research of the American Petroleum Institute, 15 West 44th St., New York City.

the metal still is used, a heavy paper gasket moistened with the solvent shall be inserted between the lid and flange before attaching the clamp.

Heat shall then be applied and so regulated that the condensed distillate falls from the end of the condenser at the rate of from 2 to 5 drops per second The ring burner used with the metal still should be placed about 3 in. above the bottom of the still at the beginning of the distillation and gradually lowered as the distillation proceeds.

The distillation shall be continued at the specified rate until no water is visible on any part of the apparatus except at the bottom of the trap. This operation usually requires less than an hour. A persistent ring of condensed water in the condenser tube shall be removed by increasing the rate of distillation for a few minutes.

10. The volume of condensed water measured in the trap at room temperature multiplied by 100 and divided by the volume of the sample used shall be the percentage of water and shall be reported as "..... per cent water by volume, A. S. T. M. method."

IV. Accuracy

11. The accuracy to be expected with this method is that duplicate determinations of water should not differ from each other by more than one division on the trap.

SAN FRANCISCO, Oct. 11.—Underwood Nazro, vice-president of the Gulf Production Co., with headquarters at Houston, is spending a short time in California on business. He left San Francisco Sunday for Los Angeles, where he will be at the Beverly Hills hotel. Accompanied by Mrs. Nadro, he recently came west after a business trip to Pittsburgh.

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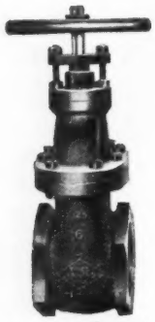

Fig. 325, Screwed Standard Iron Body Gate Valve.

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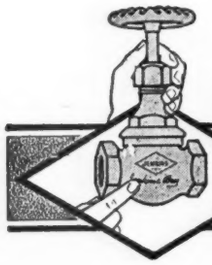

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NEW YORK HOUSTON ST. LOUIS SAN FRANCISCO KANSAS CITY BEAUMONT TULSA CASPER

Deepest Well Flowing From 5972 Feet

By Special Correspondent

LONG BEACH, CAL., Oct. 11.—Twenty-eight feet short of the coveted goal, the Clock & MacWhinney No. 1 well has just been placed on production in the Signal Hill field by the General Petroleum Corp., as the world's deepest producing oil well. The hole is 5972 feet deep.

The well is a recompletion from the 3291 foot level where it started flowing in June, 1922 at the rate of 3000 barrels a day, increased to 3500 barrels, and then declined to 750 barrels for a while, finally sanding up entirely.

The company was ambitious to finish the hole at 6000 feet, but at 5972 feet the entire string of three-inch drill pipe froze in the hole. About 5000 feet of it was left-handed off, but the remainder stuck tight and had to be left in the hole.

Opened at 5943 feet the well was given a production test a few days ago, and it flowed for thirty-seven hours at the rate of 1500 barrels a day. The company then took it off production and started running in the four-inch pipe. This will extend clear from the surface of the ground to the bottom of the hole. The oil string starts at 4000 feet and extends to 5000 feet, giving the well an oil string 1000 feet long.

Officials of the company say that from the 2500-foot level to the bottom of the hole the formation is sand and shale, and that it shows about 46 per cent pure oil sand. The oil at this great depth runs 29 gravity. When the well is placed on production again during the next few days it is expected to do from 3000 to 4000 barrels a day. This expectation, company officials say, is based upon what some of the other deep test wells in the field are doing.

The Clock & MacWhinney No. 1 has enjoyed an unusual career. The five-acre tract upon which it was drilled was bought three years ago by Ralph H. Clock and Clyde C. MacWhinney, two Long Beach attorneys, before the first oil well was brought in at Signal Hill.

The tract was high and sightly. It lay just outside the city limits, with a wonderful view in all directions, particularly toward the ocean. Its owners believed that it would be an ideal place in which to establish five one-acre country homes.

Then the Shell Co. of California struck oil at Signal Hill and Clock & MacWhinney leased their five-acre tract to an Independent operator who sub-leased it to the General Petroleum Corp. A well was drilled to the first sands and after producing considerable oil it sanded up and was allowed to stand idle. The owners of the land finally got the General Petroleum Corp. to take the lease over from them direct and a deepening job was undertaken with the result that the well is now the world's deepest producer.

In the meantime the company has drilled two other wells on the lease. The No. 2 well is flowing 275 barrels a day and the No. 3 is doing 3000 barrels per day. Up to date the Clock & MacWhinney tract has yielded more than 800,000 barrels of petroleum since the Signal Hill field was discovered on June 27, 1920.

Most South American Republics Offer Small Oil Market

WASHINGTON, Oct 11. A SURVEY of South American petroleum markets, made by Homer S. Fox, of the petroleum division of the Bureau of Foreign and Domestic Commerce follows:

It is estimated that at least 85 per cent of the total quantity of petroleum products imported into South American countries goes to the three republics of Argentina, Brazil and Chile. Thus it is seen that the remaining countries offer a relatively small market for these products.

Of the total petroleum imports into South America, approximately 25 per cent in quantity is shipped from the United States, with the remainder coming chiefly from Mexico. Some oil is also shipped from Peru to the neighboring countries, and the domestic demand is supplemented by local production in varying proportions in Argentina, Peru, Ecuador, Venezuela and Colombia. Comparatively small amounts of various products are also received from miscellaneous sources. As most of the oil imported from Mexico consists of crude and fuel oils it is apparent that the bulk of the refined oil imports is supplied by the United States. A brief survey of the petroleum market in some of the South American countries follow:

Bolivia.—There is little demand for petroleum products in Bolivia due largely to the lack of general industrial development. There are probably not more than 400 motor vehicles of all kinds in the republic and, therefore, the demand for gasoline and oils for this purpose is very limited, the total annual consumption of gasoline not exceeding 200,000 or 300,000 gallons.

Kerosene is imported to the extent of approximately 600,000 gallons annually while all other mineral oil imports, including crude and fuel oil, amount to 1,500,000 to 2,000,000 gallons.

Because of the proximity of the Peruvian refineries, a large proportion of the Bolivian importation of petroleum products comes from Peru. There is a relatively large importation of candles and of paraffin and stearin wax for the candle factories as the consumption of candles in proportion to the population is quite large. About 2,000,000 kilos of wax is imported yearly. The principal demand for lubricating oil is for use on mining machinery.

Crude oil for Bolivia is stored in tanks at Arica and Antofagasta, Chile, and brought up in tank cars or drums. Gasoline and kerosene is imported in the usual cases of two 5-gallon tins, lubricating oil in cases, kegs and drums, and paraffin wax in sacks of about 144 pounds each. Oil for the La Paz district comes through the port of Arica, while Cruro and Potosi are supplied through Antofagasta. The principal consumer of crude oil in the La Paz district is the Corocoro Copper Mines, Ltd., the chief copper mining company of Bolivia, while the chief consumers at Oruro are the tin mining companies.

Kerosene is the principal petroleum product consumed in eastern Bolivia, and as this part of the country is remote from La Paz and the plateau region and has very little trade connections with it, methods of import and distribution are quite different. Oil for the departments of El Beni and Santa Cruz and for the territory of Colonias is brought up the rivers and distributed in launches. Owing to the remoteness of these regions from the coast, the price of oil is very high but the consumption is fairly large at certain points, as in Santa Cruz, a city of 25,000 inhabitants, which is lighted almost entirely by kerosene. Considerable oil for the department of Tarija and other parts of southern Bolivia is imported through Argentina over the railroads of that country.

While there is as yet no commercial production of petroleum in Bolivia, the oil possibilities of the country have attracted the attention of large oil interests for some years and at present a considerable amount of active development work is being conducted. The obtaining of a production of petroleum on a commercial scale would undoubtedly be of great benefit to the republic, not only as a source of supply for the local market, but also as a means of promoting the general industrial and transportation development of the country.

Paraguay.—Petroleum is not produced or refined in Paraguay, and the small demand is met entirely by imports. Approximately 200,000 gallons of gasoline and twice this quantity of kerosene are imported annually, although the receipts of kerosene have been considerably higher for individual years. Imports of lubricating oil total about 200,000 kilos per year, or between 60,000 and 70,000 gallons. All products are handled in containers, and the market appears to be well covered by established connections.

Colombia.—The demand for petroleum products in Colombia is being supplied at present chiefly from domestic production, and therefore this country does not present a large market for products of foreign origin. Petroleum is found in various parts of the Republic, and a number of large oil companies are actively engaged in exploration and development of the country's oil resources. Although commercial production is comparatively recent, sufficient oil is being produced to furnish the larger portion of the domestic consumption. Early in 1922, a refinery was opened at Barranca-Bermeja and the refined products, chiefly gasoline and kerosene, placed on the domestic market, and imports, particularly of gasoline, immediately declined.

Kerosene continued to be imported, although it is probable that receipts of this item will also be much smaller in the future. Prior to the opening of this refinery, the Cartagena Oil & Refining Co., had operated for several years a plant at Cartagena for the refining of imported crude. This plant was closed, however, upon the opening of the Barranca-Bermeja refinery, the crude oil imports from the United States amounted to only 260 gallons during 1922, as compared with over 1,000,000 gallons annually during previous years.

Colombia imports of petroleum products come from the United States, Curacao and Great Britain. During 1922 exports of these products from the United States to Colombia included some 200,000 gallons of gasoline and napthas, 600,000 gallons of kerosene, 263,000 gallons of lubricating oils and over 2,500,000 pounds of parrafin wax. Some 26,000 gallons of fuel and gas oil and about 300,000 pounds of lubricating grease were also imported from the United States.

Imports of American gasoline had increased from 116,000 gallons in 1913 to over 800,000 gallons in 1920, and continued at approximately the same rate through 1921 and the first three months of 1921 when they declined to only a few thousand gallons a month, the receipts for December, 1922, amounting to only 1,500 gallons.

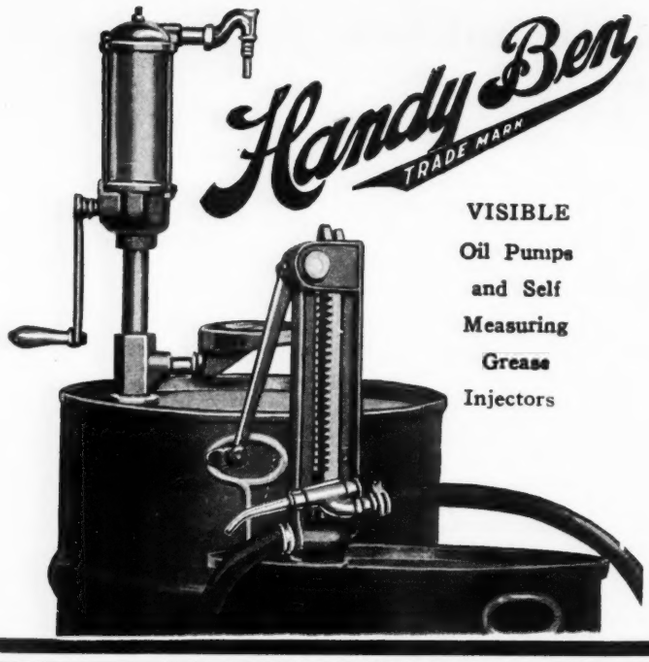
Kerosene imports of American kerosene during 1922 were considerably above the annual average of about 300,000 gallons for preceding years, but it is probable that these will also decline in future as the local production increases. Consumption of fuel oil is increasing, particularly on the river steamers and in the factories, a number of which have already installed oil-burning apparatus and other installations are being made as rapidly as equipment can be obtained. The demand for this oil will doubtless be supplied largely by domestic oil.

Lubricating oils and greases and paraffin wax are being imported in increasing quantities, and Colombia would appear to offer a fair market for theseproducts for some time to come. United States exports of paraffin to Colombia during 1922 were considerably above those for previous years, and while shipments of lubricating oils declined as compared with 1921, the general trend is upward.

Venezuela.—The petroleum resources of Venezuela are among the most important in South America, and while production of crude oil has been limited up to the present, largely because of transportation difficulties, the future output will undoubtedly supply petroleum products in increasing amounts for the local market as well as for export.

Serious attempts to exploit the petroleum resources of the country began shortly before the world war, but activity on a large scale dates from the latter part of 1920. Duriny 1921 production amounted to 1,433,000 barrels, of which about 450,000 barrels, or approximately 30 per cent, was consumed in the country and the remainder was exported. During 1922 production rose to about 2,335,000 barrels.

The refinery of the Caribbean petroleum Co. at San Lorenzo (the only refinery in Venezuela) produces gasoline kerosene, gas oil and fuel oil and the output during 1921 was as follows: Gasoline 3,340 metric tons (about 1,175,000 gallons:) kerosene, 2 200 metric tons (about 725,000 gallons); gas oil, 857 metric tons; and fuel oil, 54,630 metric tons. The crude petroleum exported goes chiefly to the refinery at



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Inventors and Manufacturers of Grease and Oil-handling Devices

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We have been satisfying customers for 35 years.

When in the market for Pennsylvania Petroleum Products—think *Continental.*

Curacao, although some shipments are made to the United States.

Imports of petroleum products into Venezuela come principally from the United States, with smaller quantities from Trinidad, Curacao, and the United Kingdom, and an appreciable amount of paraffin is received from Holland. Kerosene imports from the United States have declined steadily since prewar years, and now amount to about 300,000 gallons or less annually, as compared with 1,500,000 gallons in 1913. The gasoline consumption of Venezuela is estimated at somewhat less than 2,000,000 gallons annually, the larger portion being supplied from domestic production. About 200,000 gallons of lubricating oil are exported annually from the United States to Venezuela, and Great Britain, Trinidad and Germany supply smaller amounts, the total importation of this class of oil amounting to less than 300,000 gallons in a normal year. Crude petroleum and fuel oil are not imported, the demand being supplied from the local output.

All refined petroleum products imported into Venezuela are received in containers, chiefly the usual cases of two 5-gallon tins. The domestic products are handled in cases and drums, gasoline principally in drums and kerosene in cases, the only oils transported in bulk being fuel and crude oils. At each seaport there are facilities for discharging cased goods by the usual methods, but the only ports at which there are facilities for the discharge of bulk petroleum cargoes are Puerto Cabello, Maracaibo, and LaGuaria. At each of these ports vessels up to 11½ foot draft can discharge fuel oil directly via 6-inch pipe lines to storage tanks, and tank cars are used for transporting fuel oil to Caracas. These facilities are privately owned and are used for the distribution of domestic oil only.

Most distributing and storage facilities are of light products in containers only. Facilities for local distribution are owned by the distributing companies already established, which handle the larger portion of the trade. Odd lots of gasoline and kerosene from other sources are imported but the quantity is small, although lubricants are imported directly by many garages, dealers, and railroad and mining companies.

Ecuador.—Supplies of petroleum products for the market of Ecuador come chiefly from Peru and the United States, supplemented by the small local output. The annual production of petroleum in Ecuador amounts to about 50,000 barrels, the only locality in which there is a commercial production being in the neighborhod of Santa Elena, on the north coast of the Gulf of Guayaquil and about 90 miles west of the port of Guayaquil. Imports are relatively unimportant, as the population is small and there is no great industrial development.

Imports of kerosene during 1921 totaled 436,640 gallons, of which 404,300 gallons came from Peru and the balance from the United States. About 44,000 gallons were also produced locally. Peru also supplied the major portion of the gasoline imports, which totaled 428,530 gallons, only 20,000 gallons coming from the United States.

The
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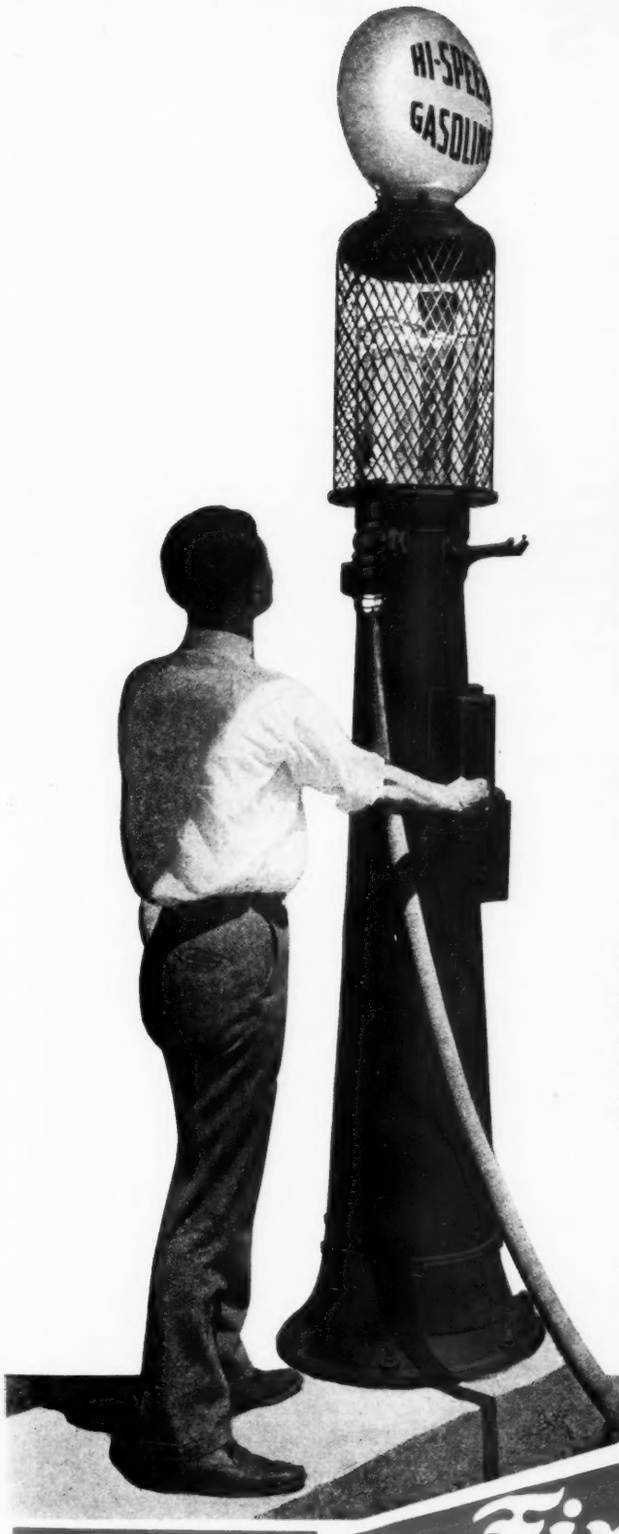
of the
FINDLAY RIGHT-A-WAY

Gives practically continuous delivery

THERE is no delay in delivering 15, 50 or 500 gallons of gasoline through a Findlay Right-A-Way visible dispenser. The fact that it passes through in 5 gallon units in no way slows down performance on greater quantities. Each 5 gallons is handled with such amazing speed that the flow of gasoline is practically continuous. And the purchaser is able to see that he is getting all he pays for.

The Findlay shows the car owner every five gallons as it is measured out to him, and it handles each five gallons without any loss of time or extra labor.



The Findlay Right-A-Way will deliver 15 gallons into a car in less than one minute. The average handling time for 5 gallons is 15 seconds. The costof operation is so low that it is invisible on less than large quantities. Average filling station costs show that it costs less than a cent to deliver 1800 gallons with the Findlay.

It's easy to operate. A touch on a button fills the dispensing chamber. There is no wear out to the Findlay. It's guaranteed against wear for five years.

The Findlay does not agitate the gas. It delivers the most volatile blends without evaporation losses.

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FINDLAY, OHIO

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RIGHT-A-WAY
VISIBLE DISPENSER

WHY MARVEL PUMPS
FOR OIL AND GREASE

REASON NO. 10

Sales Value

TAKE Equipment that helps remove the resistance to your selling; offers a strong inducement for buying; binds a customer to you—and what have you got? Sales value.

Dealer demand, advertising value, mechanical superiority and adaptability—these give sales value to Marvel Barrel Pumps. No doubt about it. The Marvel "Book of Facts" proves it.

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Manufacturers of oil, grease and gasoline handling equipment. Direct representation and warehouse stocks in principal cities.

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OTHER REASONS

1 MANUFACTURING POLICY
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3 MECHANICAL SUPERIORITY
4 MORE FEATURES
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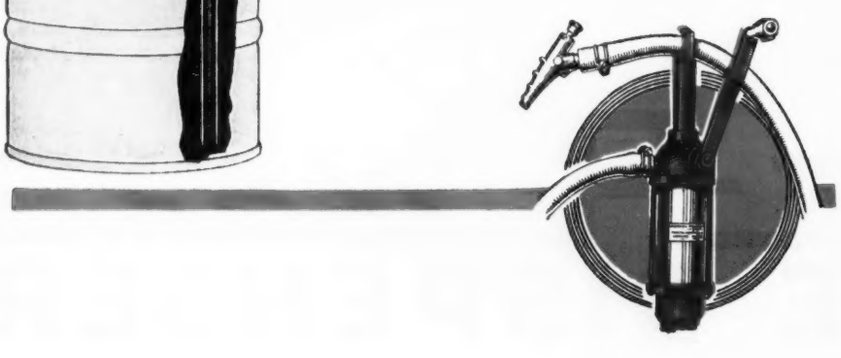
8 SALES HELPS
9 ADVERTISING VALUE



and about 7,000 gallons from the domestic refineries. As there are only some 650 motor vehicles of all kinds in the country, the market for gasoline and motor oils is very limited.

The small quantity of lubricating oil used, 44,385 gallons in 1921, comes almost entirely from the United States, as does the asphalt used for paving. Some lubricating oil and grease is imported from the United Kingdom, which is also the source of most of the candles received.

A small quantity of bunker oil is usually available at Guayaquil, and a contract was authorized during the latter part of 1922 which would include the establishment of a bunkering station at Bahia de Correos in the Galapagos islands to be of sufficient capacity to suply ten ships of 5,000 tons.

No statistics have been published relative to the market for white oils and petrolatums in Ecuador, as the volume of this trade is not of sufficient importance to warrant a separate place in the customs statistics. Such products of this nature as reach the Ecuadorian market are handled by the drug stores, and it is probable that business of this kind should be done with the drug stores direct, rather than through the appointment of a representative.

Suggest Uniform Rule For Empty Mileage

CLEVELAND, Oct. 11.—Judge C. D. Chamberlin, secretary and general counsel of the National Petroleum Association in a recent bulletin asks the members of his association for their opinions and suggestions on the recommendation of the transportation division of the American Railway Association that Car Service Rule No. 13 be made uniform over the country to avoid a great deal of difficulty now arising from excess empty mileage through incorrect billing or misrouting.

The rule (Car Service Rule No. 13) reads as follows:

"1. When private tank cars are unloaded, the owner will issue instructions for empty movement to the agent at point of unloading either direct or through consignee. The agent will bill each car to final destination showing name of the consignee and full route, using standard form of Revenue Way-Bill. The word 'consignee' in this connection signifies the party to whom the empty tank car is forwarded.

"2. Agents at stations where tank cars are unloaded should secure complete billing instructions for the empty movement from the shippers, consignee, or car owner, the instructions to show full routing, including junction points of delivery to other roads.

"3. In billing the empty tanks agents will use standard form of Rvenue Way-Bill."

ALGONA, IA., Oct. 11.—The Standard Oil Co. will open its second service station here shortly, making a total of five stations in this city. The Sinclair Refining Co. will open a station in a few weeks, says O. S. Lindsay, agent for the Standard Oil Co. here.

Industrial Notes

The Calorizing Co. Oliver building Pittsburgh, Pa., has issued a bulletin giving the results obtained when calorized tubes were used to replace steel tubes in cracking stills. The bulletin says that corrosion due to sulfur and salts in oils was practically overcome. One refinery after five months' test submitted figures:

	Comparative Corrosion
Calorized steel	.009
Steel plate	.450
Alloy-70 copper, 30 zinc	.126
60 nickel, 4 iron	1.204
Alloy-70 copper, 30 zinc	.126

This plant according to the bulletin, reported that the coke deposit in the calorized tube was 30 per cent less than in the steel tube alongside it during the same run.

Link-Belt Co., 910 S. Michigan avenue, Chicago, has bought the Meese & Gottfried Co. of San Francisco, Los Angeles Seattle and Portland, Ore., manufacturer of power transmission machinery. It will be known henceforth as the Link-Belt Meese & Gottfried Co. and will take over the sales offices formerly maintained by the Link-Belt Co. on the Pacific Coast. The Meese company has manufacturing plants at San Francisco and Seattle. The Link-Belt Co. has factories at Chicago, Indianapolis, Philadelphia and Toronto.

Oil Service Equipment, 444 W. Grand avenue, Chicago, is putting out a gauge pole graduated in gallons as well as inches for gauging tanks, tank cars and tank trucks.

Price calculators with calculations ranging from 1 to 50 cents with fractions of cents and quantities from 1 to 100 gallons are put out in several styles of cards and loose leaf booklets.

C. J. Tagliabue Manufacturing Co. 18 33rd street, Brooklyn, N. Y., has just published its 18th revised edition of the Tag Manual of inspectors of petroleum. The various tests and methods of testing have been brought up to date. The manual also contains valuable gravity temperature correction tables.

Uehling Instrument Co., Paterson, N. J., has issued a new bulletin, No. 116-A, which illustrates three devices which, it is claimed, eliminate the troubles caused by soot, moisture and sulfur in carbon dioxide equipment. In other words, fouling and corrosion are prevented.

Oil Conservation Engineering Co., Cleveland, has just published a new catalog covering its Oceco line of self-closing gauge and thief hole, and manhole covers. The catalog is illustrated with pictures of installations and diagrams of various types of covers designed to minimize evaporation losses and fire hazards. The company has opened offices at 220 Iowa building, Tulsa, and 401 Perlstein building, Beaumont, Tex. Arrangements have been made with the Beaumont Export & Import Co. to represent it at Tampico, Mexico City and Monterrey. Branches also have been established at 440 Howard street, San Francisco, and 318 E. 12th street, Los Angeles.

United Iron Works, Inc., Kansas City, Mo., has issued a bulletin, featuring its water-seal top tanks in sizes up to 100,000 barrels' capacity. The cost of these tanks is but slightly more than all steel tanks, the manufacturers say.

Gas Products Association, 140 S. Dearborn street, Chicago, recently appointed an educational committee to co-operate with trade and technical schools all over the country in supplying a practical and standard course in welding procedure. The users of oxy-acetylene welding equipment have never been thoroughly satisfied with the work done by welding school graduates, and at the same time the application for the welding processes has been extended to so many new fields that the demand for skilled operators is constantly increasing, the association announces. It is thought that by making a thorough investigation of the needs of the industry and then making recommendations to welding school instructors, the instruction programs can be revised and standardized so as to more fully meet the requirements of the employers.

The Brown Instrument Co., Philadelphia, exhibited at the recent chemical show in New York its new carbon dioxide meter which measures electrically the percentage of carbon dioxide in flue gas.

"This instrument," said R. P. Brown, president of the company, "works on the principle of difference in thermal conductivity of various gases instead of on the principle of chemical analysis. This principle of the difference of thermal conductivity has been known for some time but not until recently has any commercial use been made of it. While this type of instrument has been developed abroad and a few imported instruments have been sold in this country, we are the first American manufacturers to produce equipment of this nature.

"I believe this type of electrical indicator and recorder will ultimately replace the present instruments for measuring carbon dioxide. The attention required with an instrument operating on this new principle is very small compared with the attention required where the persent type instruments are in use, which mechanically go through the chemical analysis of the gases."

The new instrument permits of the indicating and recording the percentage of carbon dioxide at any distance from the boiler. It shows continually the percentage of carbon dioxide and not the result of the analysis of a sample.

(Continued on next page)

"Be Square Products"

Pioneers in the manufacture of High Grade Uniform Quality Western CylinderStocks known all over the world as

Bigheart Cylinder Stocks

Bright Stock
Filtered Stock
Steam Refined Stock
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Barnsdall Refining Company

Successor to Bigheart Producing and Refining Co.

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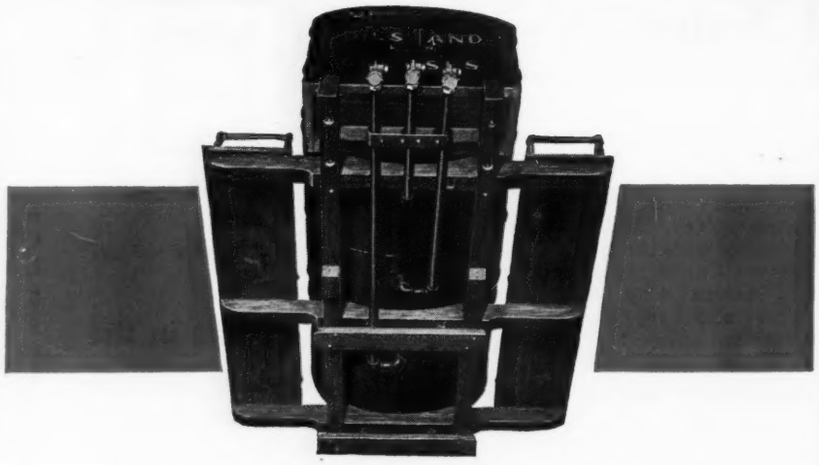


Bottom View Of Truck Tank

This cut shows the bottom of our special constructed Ford Truck Tanks.

NOTE:- Reinforcement of Tappings
Way of piping to take off all unnecessary strains.
System of framing, which is specially designed for Ford Truck.

BROWN CERTIFIED TRUCK TANKS are used in all parts of the United States and Canada, and we have a few abroad. They are built in all sizes and shapes to meet your requirements.

BROWN CERTIFIED TANKS are known all over the country for their DURABILITY, STRENGTH, and TIGHTNESS.

Write us for prices and catalog.

BROWN CERTIFIED STEEL PRODUCTS include I. C. C. Barrels and Drums, Compounding Kettles, and all classes of Storage Tanks up to 30,000 gallon Capacity. Licensed Manufacturers of Van Tilburg Petroleum Fractionating Equipment.

BROWN SHEET IRON AND STEEL COMPANY
978 BERRY AVENUE ST. PAUL, MINN.

THE NEW AND REVISED TAG MANUAL
FOR INSPECTORS OF PETROLEUM

This new edition of an old trade stand-by contains the REVISED Temperature Correction Tables for A. P. I. (141.5 Modulus) Hydrometers recently completed at the Bureau of Standards in line with A. P. I. recommendations. Also ten other important tables and the detailed procedure for thirty-two routine oil tests. Price $1.00.

Send for Catalog M 699

C. J. TAGLIABUE MFG. CO.
18 to 88 Thirty Third Street,
BROOKLYN, N.Y.

Largest and Oldest Makers of Oil Testing Instruments

Determination is within 0.5 per cent of absolute accuracy.

The company has issued a catalog, No. 30, which illustrates the instrument, and explains and pictures in detail installations. A chart taken from an instrument installed at a Philadelphia silk mill, is reproduced in the bulletin to give an idea of how the instrument records.

White Reorganization Plan Announced

NEW YORK, Oct. 10.—Plans for the reorganization of the White Oil Corp. have been completed by a committee representing the holders of the preferred stock, the first mortgage bonds and a large part of the common stock.

A new company will be organized in New York with $3,000,000 first mortgage and collateral lien 8 per cent bonds, 60,000 shares of preferred stock, par $25, and 600,000 shares of common stock of no par value.

Common stock must be deposited with the Chase National Bank of New York by Oct. 20. Holders of each 30 shares of the existing common stock will be given the right to subscribe to $100 of the new bonds and will receive six shares of the common stock of the new company. Enough of the bonds have been underwritten, if the plan is consummated, to provide for the payment of bank loans and the present outstanding first mortgage bonds. The underwriting has been done upon the same terms as the offering to stockholders.

The present preferred stockholders, who have received no dividend since March, 1922, will, under the plan, waive accumulated dividend payments of about $200,000 and agree that dividends on the new preferred stock shall not become cumulative until December 1, 1924. In return for this concession they will receive 10,000 shares of the new common stock.

Under the reorganization, in addition to the bonds, $1,500,000 new preferred stock and 10,000 shares of new common stock will be issued to the present preferred stockholders; the present common stockholders will receive 190,258 shares of new common stock; and subscribers to or underwriters of the new bonds will receive not more than 180,000 common shares, making a total of 380,258 shares of new common to be issued. In addition 60,000 shares of the new common will be reserved to convert the new preferred stock.

The reorganization committee is comprised of Murray W. Dodge, chairman; C. Howard Marfield, R. G. Hutchins, Louis E. Stoddard, and Oscar L. Gubelman. Otis Everett, 57 Broadway, is secretary.

Charges Unfair Prices

BOSTON, Oct. 11.—The Massachusetts Commission of the Necessaries of Life after investigating the price of gasoline in this state has reported on an alleged discrimination against the motorists here as compared with prices charged in other states. The commission states that prices elsewhere are considerably below the price in Massachusetts and to a greater degree than the difference in freight rates.

A copy of the report is being sent to the Federal Trade Commission and one will be submitted to the conference of state attorneys general in Chicago,

H.G. James To Address New York Producers

By Special Correspondent

WELLSVILLE, N. Y., Oct. 11.—H. G. James, Derby Oil & Refining Co., of Kansas City, will be the principal speaker at the banquet which will mark the close of the fifth annual meeting of the New York State Oil Producers' Association here on Friday, Oct. 19.

At the business session in the afternoon representatives of the Pennsylvania Grade Oil Association will discuss means of advertising qualities of Pennsylvania lubricants so as to stabilize the price of Pennsylvania crude.

The association expects as one of its guests, Archie Roosevelt, son of the late Theodore Roosevelt. He is one of the officers of the Sinclair Consolidated Oil Corp. and directly interested in the local field because of the Sinclair ownership of the Wellsville refinery.

President Lewis H. Thornton announces that following an opportunity to visit the Wellsville oil refinery in the forenoon, the United States Bureau of Mines moving picture films entitled "The Story of Oil," and "The World's Struggle for Oil," will be presented at the Babcock theatre at 1 p. m.

Bills Affecting Oil

Bills affecting the oil industry introduced at the special session of the Arkansas legislature are herewith summarized from the legislative letter of the American Petroleum Institute:

Senate Bill 8 would validate oil and gas leases made by school districts.

House Bills 36, 37 and 38 are general highway bills.

House Bills 52 and 55 are general highway measures with gasoline tax features.

House Bill 63 provides specifications for gasoline.

Foreign Opportunities

Reserved information may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, and its district and cooperative offices by duly registered firms and individuals upon written request by opportunity number. The Bureau does not furnish credit ratings or assume responsibility as to the standing of foreign inquirers; the usual precautions should be taken in all cases, and where no references are offered it does not necessarily imply that satisfactory references could not be given. Correspondence may be in English unless otherwise stated.

7813.—**Lubricating oils, kerosene and paraffin,** Oporto, Portugal, agency.

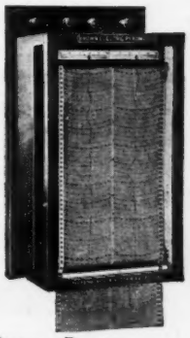
7817.—**Lubricating grease,** London, England, agency.

7844.—**10 or 20 tons paraffin** for industrial use, Basel, Switzerland, purchase.

7880.—**Motor oils, lubricating oils and greases, gas and fuel oil, and gasoline,** Antwerp, Belgium, purchase and agency.

7908.—**Lubricating oils,** 2500 gallons monthly, Nantes, France, agency.

At the Milwaukee Convention



Brown Duplex Continuous Recording Pyrometer for all high temperatures.
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Talk over with actual users the work BROWNS are doing in Oil Refining

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Brown Resistance Thermometer (Indicating and Recording Types) for temperatures from minus 300° F. to plus 1800° F.
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Brown Recording Pressure Gauge—for all pressures and vacuums.
Catalog No. 73.

and practical, definite information on any point regarding the application of Brown Instruments to your own individual problems.

Just drop a line giving name and address to The Brown Instrument Company, 4518 Wayne Ave., Philadelphia, or one of our district offices in New York, Boston, Pittsburgh, Cleveland, Columbus, Birmingham, Detroit, Chicago, Indianapolis, St. Louis, Denver, Los Angeles, San Francisco Montreal.

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Temperature, Pressure, Recording
Instruments

Independent Refining Company

Established 1880

For nearly *half a century* our products have stood at the top of all quality products made from that crude of all crudes,

PENNSYLVANIA,

and still we serve.

If your name is not on our books permit us to show you.

Oil City - Pennsylvania

FOR SALE !!

GASOLINE and OIL SALESMEN

OUR Convex Electric Signs are the most efficent Filling Station Salesmen you can put to work. And these husky, rugged fellows will keep working for years without care or attention.

These all-metal salesmen never loaf on the job. They're always at work, day and night, winter and summer, year in and year out.

Dressed in bright, snappy colors in the daytime and scintillating like a million diamonds at night, they stand right out in the open with a cheery greeting for every approaching motorist.

And they remind him, in the most pleasant way, of things that he really needs and at the time he is ready to buy.

Ask us to show you how cheaply we can furnish one of our permanent "sales crews" for that filling station.

The McSavaney Company

Makers of Electric Signs that Sell Goods

SPRINGFIELD, OHIO

Build Tunnel For Sinclair Pipe Line Under Deep Waterway Canal

By Ward K. Halbert

STAFF REPRESENTATIVE

CHICAGO, Oct. 11

A TUNNEL under the Indiana Harbor Canal to convey all of its lines to refineries in Whiting and East Chicago, Ind., has just been completed by the Sinclair Pipe Line Co., of Tulsa. It required four months to do the work, using all the men possible to use on such a piece of construction, and it cost close to $100,000. That figure, of course, includes expenditures of the company incidental to building the subterranean passage. The contract price of the finished hole was $65,000.

The completed piece of engineering might be described aptly as an inverted siphon. It consists of two vertical concrete tubes, each 10 feet in diameter and 65 feet deep, and they connect at the bottom with an arch-top horizontal tunnel 7x7 feet in cross section and 300 feet long. The concrete shell is reinforced with steel and uniformly 18 inches thick. On the floor against each wall 10 feet apart is a row of concrete supports for the pipe lines. Each row of these inverted brackets will sustain two strings of pipe, the 12-inch below and the 8-inch above.

For Use at Once

One of the larger and one of the smaller lines in the tunnel probably will be in use before this article gets into print. All four lines are laid but possibly all will not be used before the early part of next summer when the Wyoming crude starts coming into Chicago. The capacity of the tunnel is not limited to four pipes. Steel hangers have been built in the walls above the supports where additional lines may be hung if necessary. It is rumored that they may carry refined oil lines of smaller dimensions, too, as Sinclair Refining Co. is building new storage across the canal from its East Chicago plant which is not all for crude.

Why did the Sinclair Pipe Line Co. spend so much time and money on a crossing for the Indiana Harbor Canal, a shallow currentless waterway? There are two important reasons, and one of them has an immediate bearing on the situation.

First: Experience has shown that wrought iron line pipe, which may be depended upon to give service for upwards of 15 years under reasonable circumstances, lasts less than five years in the Indiana Harbor Canal. The water in it does not flow, and its banks are lined, in several sections, with steel mills and refineries and similar plants. Its water is void of any form of life. It is a fact that the stagnant bayou does not even breed mosquitos, and that is saying a great deal for the region of Lake Calumet.

Second: The canal is a part of the proposed deep waterway system of Chicago, which may or may not materialize soon but has to be reckoned with, nevertheless. Legally the canal is 21 feet deep and 200 feet wide all the way along, and it may be dredged to those actual dimensions sooner than is generally foreseen. Several eastern steel companies have acquired acreage along the canal and the chances are they will erect plants on these tracts if the mooted "Pittsburgh Plus" argument is decided in favor of Gary. When and if this begins, the old canal will undergo some changes which will disturb pipe lines and everything else that happens to be in it.

View of the inside of the pipe line tunnel, photographed while the last pipe was being laid. The 12-inch pipe in the middle has been seated in the support on the left and electric lights have been evenly arranged since the picture was made.

A Permanent Job

Now the Sinclair pipe lines, from the Rocky Mountains and the Mid-Continent, are forever out of the way of the dredging, and chemicals and electrolysis of the Indiana Harbor Canal. Pipes are now accessible for repairs if they need it, and there is room in the tunnel, as it stands, for several times its present pipe line capacity.

The concrete floor of the tunnel slopes very gradually to the center from both sides, and slopes also gradually toward the north end where a sump is built in the floor directly under the shaft nearest the refinery. In case of any sort of an accident that might cause oil to be spilled in the tunnel, it will not be hard to clean out. It will flow by gravity into the sump at the point most easily accessible from the refinery. The walls are plastered white and lighted with electricity.

A short span of the tunnel at the north end is 10x10 feet in cross section instead of 7x7, made so to facilitate the handling of pipe and allow for wielding pipe tongs. It is the plan now to weld at least one of the lines and possibly both, but allowance was made for screwing pipe together anyway. The fact that the earth taken from the tunnel is fairly good potter's clay has proven an advantage to the company. All of it was taken out at the south end of the siphon and piled near. It will be used as a top covering for the earthen dykes around tanks on the adjacent tank farm. The fire walls are just now being graded into shape.

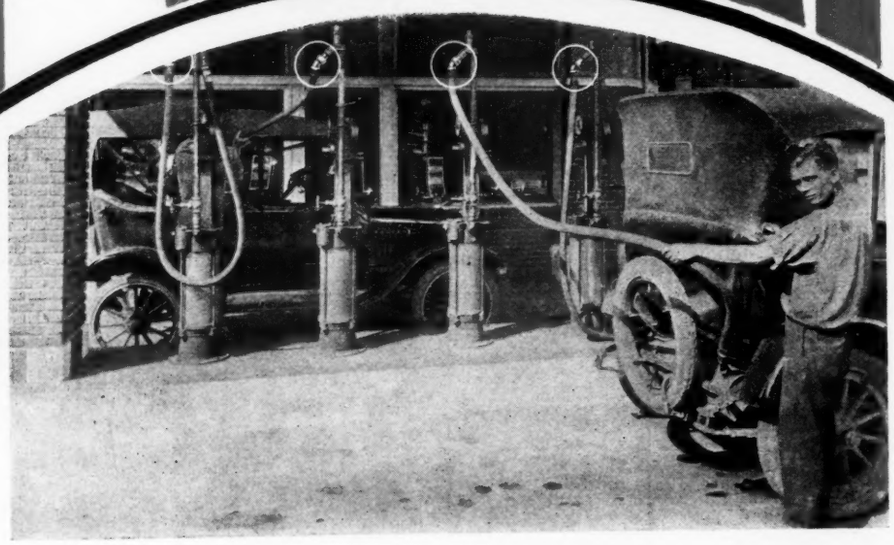
The picture illustrating this story was courteously supplied by Leon L. Clark and Ernest A. Clark of the Subway Engineering Co., as well as a great deal of the technical information contained in the article itself.

6000 Miles of Line

Within the past year the Sinclair Pipe Line Co. has built close to 3500 miles of line, which means that it has more than doubled its length in that time. It is roughly estimated that there are 6000 miles of line all told in the system—including loops. Freeman, Mo., is the junction of this system. Most of the oil handled by the pipe line passes through Freeman which is about 40 miles south of Kansas City, and otherwise is not especially important.

Sinclair lines extend two ways out of Drumright, Okla. A line capable of handling 20,000 barrels a day goes to Houston, Tex., and a 70,000-barrel line goes from Drumright to Freeman. At that point a 30,000 barrel line from Casper, Wyo., will connect with the system. It is at Freeman also that a 12,000-barrel line leads off, to Sinclair's refinery at Argentine, Kan., and a 20,000-barrel outlet leads to Standard Oil Co.'s plant at Sugar Creek, Mo. Lines aggregating 50,000 barrels in capacity continue from Freeman to the Calumet

McDONALD



McDONALD CURB PUMP SWING JOINTS

A New Idea

This curb pump swing joint has long been needed for preventing twisting and kinking of hose when raised for draining.

Provides flexibility at point where hose is connected to pump, greatly prolonging life of hose.

These joints are patterned after our famous larger Swing Joints, which are known and used wherever petroleum is produced and refined.

They are made in single or double type, with either male or female thread for attaching to hose, and in suitable styles for all makes of curb pump.

Material all brass. Sizes, 1¼" and ¾".

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"One of the World's Oldest and Largest Makers of Oil Handling Equipment"

A. Y. McDONALD

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EST. 1856 McDonald

"The PIONEERS in Offering Complete Bulk Station Equipment"

district of Chicago—that adjunct to the city lying in Indiana.

The line from Oklahoma soon will be operating through the tunnel under the canal.

As far as the contracting engineers know, this is the first piece of conduit of its kind ever constructed to carry oil. Most streams are crossed just as the Mississippi river was crossed, by sinking the line in the bottom of the river. A special sleeve to cover joints perpetually under water, has been adopted by the Sinclair Pipe Line Co. An excellent picture of an installation of this kind appeared on page 38, Aug. 29 issue of **National Petroleum News.** The East Chicago construction, however, keeps every pipe out of reach of molestation by floor or dredge and always accessible for repair.

The tunnel extends due north-and-south about 60 feet below the east curb-line of White Oak avenue, East Chicago. That spot can be found more easily on a map than on the prairie because White Oak avenue exists in name only. For the benefit of persons knowing the "lay of the land," it is a quarter of a mile west of the bridge on which Forsythe avenue crosses the canal north of town, a "mashie shot" from the B. & O. railroad bridge.

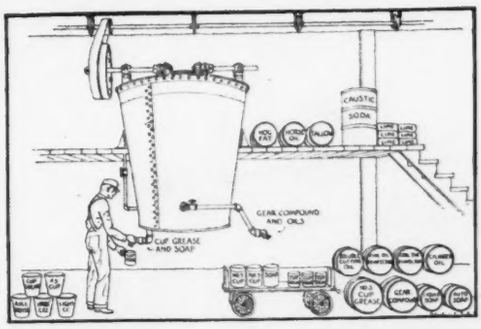
The siphon was designed and constructed by the Subway Engineering Co. of Chicago. Lines and grades were established by the contractor. Work began June 16 and the tunnel was holed through on Sept. 15. It was under the general supervision of three Sinclair Pipe Line Co. men, Frank Hadley chief engineer; W. E. Brewer, division engineer and H. S. Joyce, resident engineer.

Construction of Shafts

The shafts are 13 feet in outside diameter and 10 feet inside the concrete lining. The first 25 feet of excavation for the shafts was through fine, water-bearing sand with a few thin layers of gravel. On the south shaft the next 10 feet was through soft, tough clay containing a few small stones, but on the north side of the canal the material was different encountering about five feet of black muck in which several small red cedar logs were buried. The remainder of the distance in both shafts was much alike, tough clay containing a large percentage of small pieces of stone and slate. Little water was encountered after the shafts were 10 feet in the clay.

The shafts were sunk by the open dredging method to near the depth where the tunnel should begin. That is, the tube was built from the top in sections four feet long. Constructing one section to top of another the shaft sank in the ground of its own weight and the core was pumped out. When at a level near where the tunnel was to start, the tube encountered a formation hard enough to halt its sinking, men went into the hole and under-reamed to the bottom. Several small wash-ins occurred in both shafts, caused by sticks and flat stones getting under the cutting-edge and making a small channel on the outside of the shell. Forms were left in place 48 hours. Two sets of forms were used for each shaft.

The forms used in building the concrete linings for the shafts in four-foot sections as described, were made of



Manufacturers Exclusively of Single Unit

Grease and Oil Compounding Equipment

The right size for the jobber with a small Boiler and Motor

F. E. MARTIN & CO., Lake Bluff, Ill.

A CONTRACT with us equalizes all changing conditions.

Our contracts are based on that world old "Law of Averages", which always prevails over a period of time.

Insure your future gallonage by securing your products from the world's greatest, single, independent refining unit.

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Gasoline and Oil Filling Stations

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We manufacture the simplest to the most elaborate Stations. Put your own individuality in your Filling Stations—Let us help you work this out.

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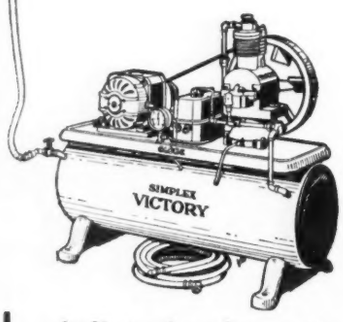
524-544 Eggleston Ave. Cincinnati, Ohio

Let the Simplex Inflate your Business —



Great Scott—

he's up at last and with the SIMPLEX Free Air Unit, he'll never stop.

Old Man Business has been deflated so long, the change is a pleasant surprise

If your business needs inflating, let the SIMPLEX do it—QUICKLY, EASILY AND CHEAPLY.

GLOBE MFG. CO. Battle Creek, Michigan

wood. The cutting-edge on the bottom of the first section in each shaft was made of steel. It was built of a steel plate two feet wide and three sixteenths of an inch thick encircling the outside, and at its lower edge an angle iron 4x4x½ inches. This was anchored to the concrete with anchors a yard long and five-sixths of an inch in diameter spaced two feet apart. The concrete was reinforced both horizontally and vertically with square half-inch bars, two feet apart.

The Equipment Used

Equipment for the south shaft consisted of a traveling derrick, 11-foot gage, with a 40-foot boom for handling a half-yard clamshell bucket operated by a 7x10 double cylinder double drum steam hoisting engine. Air for the pneumatic shovels used in excavating, and also for ventilating the tunnel, was supplied by a 10x10 steam air compressor with an air receiver 60 inches by 6 feet. Steam to run the compressor was supplied by the boiler of the hoisting engine. Water for the work was supplied by a two-inch gasoline pump connected to well points. The canal water was not safe to use in boilers nor fit to use in mixing concrete.

The equipment for the north shaft consisted of a 60-foot guy derrick with a 50-foot boom handling a half-yard clamshell bucket and operated by a three-drum 8x10 steam hoisting engine. Concrete was mixed in a half-yard gasoline-driven concrete mixer and placed in the forms with the derrick and a bottom dump bucket. Water was conveyed from the pump on the south side through a 1¼-inch pipe laid on the bottom of the canal.

Digging the Tunnel

Lines for the tunnel were established with heavy plumb bobs suspended in the shafts. Most of the earth under the canal was like that in the lower ends of the shafts and in such material it was the rule to mine six feet and concrete it, in a single shift of nine hours. The contractors worked two shifts and thus the tunneling progressed 12 feet a day. Occasionally when a sand pocket was encountered, mining, timbering and concreting was done in three-foot sections as a precaution against caving and consequent loss of time.

The excavated material was handled in steel V-shaped side dump cars holding a half a yard. They operated on a little track in the tunnel built of 16-pound rail, laid by 14-inch gage and resting on wooden ties 4x4x36 inches, placed 3 feet from center to center. The cars were lifted through the south shaft on a 4x5 elevator operated by the steam hoist. Three pneumatic shovels were used in making the excavation and the muck was handled by four men, two muckers and two cars pushers, keeping the loose dirt out of the hole.

Steel ribs made of two pieces of six-inch channel iron with angle iron lugs at top and bottom for bolting together, and wood lagging 2x6 inches with beveled edges, were used for the forms of the concrete lining of the tunnel. A medium dry mix of concrete was used for the tunnel, and gravel was used for coarse aggregate throughout. The mixture was 1 to 2½ to 4. The mix was poured into the shaft forms with the derrick and bottom drop bucket, but in concreting the tunnel it had to be handled in the steel dump cars and then shoveled and tamped into the forms.

REFINERY-TANK WAGON MARKETS

Mid-Continent Gasoline Stronger; Hight Test Most Active

(Refinery Market Prices, pp. 131-133)

TULSA, Oct. 13.

MID-CONTINENT gasoline markets have gained rather than lost momentum during the second week in October. All grades of gasoline have become increasingly tight. Stocks have become even further depleted as jobbers have bought for current needs in good volume and weather conditions have been reasonably good for motoring considering the lateness of the season.

High gravity motor fuels have been the center of interest throughout the Mid-Continent during the week. A scarcity has developed of 60-62 as well as 64-66 and 68-70. Buyers have been forced to shop around in order to get car numbers and prices are being advanced by refiners as their stocks as well as current production are being sold.

It appears that jobbers throughout the marketing territory served by the Mid-Continent are turning to the distribution of high test winter gasolines more and more each year. Jobbers who have never carried a premium grade of gasoline before are in the market. The distributors who have been building up a business in quality goods for fall and winter driving by extensive advertising appear to be getting better results than before and are increasing their purchases.

High Test Material Scarce

There has been no extensive export buying of high gravity gasolines in Group 3 for some time. North Texas has enjoyed a much larger business of that character. The scarcity of high test material in Oklahoma appears almost entirely due to domestic business coupled with the low stage of crude runs being maintained by refiners.

Thus far the scarcity has not resulted in general price advances which would throw the products out of their usual relationship with Navy. The 60-62 grade is obtainable at 2 cents over Navy and 64-66 is selling at 3 cents over Navy. Some goods have moved during the last day or two at advances of ¼ cent. Refiners predict that additional advances will be forced within the next week or so if business maintains its present volume.

Although Navy has been somewhat quieter than high test goods the movement has been even above what had been expected. There is no surplus on the market and more is moving at 6¾ cents than at any time this month.

The International Petroleum Exposition and Congress has occupied a large part of the attention of refiners as well as producers and manufacturers of equipment this week, detracting from interest in the market. In addition to the 150 jobbers who were guests of Cosden & Co. at Tulsa this week there were a considerable number of wholesale dealers from middle western states in attendance. Refiners generally held open house for their visitors and sold gasoline in many cases both for spot and future delivery.

Pays 6½ For Navy

One jobber visiting the exposition, placed an order for all of his prospective gasoline requirements up to Jan. 1. The jobber paid a flat price of 6½ cents for the goods. Some goods have been sold for delivery over the remainder of the month and November at a similar price and some for 45 days' delivery at as high as 6¾ cents a gallon and considerable spot Navy is moving today at 7 cents.

Generally speaking, jobbers are not ready to admit yet that the Mid-Continent market has a chance to remain at its present level over the winter or to advance above 7 cents until buying for spring stocks begins. They are still buying for current requirements only.

Events of the week lead to the belief that the price of Mid-Continent crude is in a shaky position again and that there may be a revision by dominant factors in Oklahoma. In Texas The Texas Co. cut 40 gravity crude 50 cents and 33-39.9 gravity crude 20 cents on Tuesday and began taking 100 per cent of the oil. This morning Magnolia established a similar schedule, keeping its low gravity prices unchanged and agreeing to take all of the oil.

The cut in California light oil amounting to 28 cents on 35 gravity crude is considered as the most important factor in the Oklahoma crude market now. At the time the Prairie Oil & Gas Co. made its last posting it announced that it hoped to be able to take more crude and boost its sales in the east in competition with California.

If Prairie Would Compete

If the Prairie still desires to compete with California it is believed that it must cut the price of Mid-Continent crude to somewhere in the vicinity of $1 to $1.10 on 33-39.9 gravity oil. Some are of the opinion that the Prairie may abandon grading altogether when it makes its next announcement. At $1 a barrel the Prairie could lay down crude on the Atlantic seaboard to its customers at around $2.06 a barrel, which would compare very favorably with 26 gravity California crude laid down at around $1.95 a barrel at the same plants.

In view of the condition of gasoline stocks outside of a few companies it is doubted by some market factors whether a reduction in Mid-Continent crude would have an immediate adverse effect on the gasoline market. They assert that present prices have already more than discounted any possible decline in crude.

Statistics of the Bureau of Mines on refinery activities in Oklahoma and Kansas for August just released reveal the reason for the stronger position which gasoline occupies today. Refiners cut their runs in the two states to a daily average of 169,450 barrels from 192,999 barrels in July and a high point of 236,807 barrels in January. Runs were at the lowest ebb in the field since February, 1922.

Coupled with their decreased production of gasoline the two states sold more motor fuel than in any previous month during the past two years. Daily average sales of 4,303,083 gallons represent an increase of roundly 300,000 gallons a day over July and more than 500,000 gallons a day over August, 1922, the peak month of that year.

Stocks were reduced 40,189,115 gallons during the month to 201,983,469 gallons, a decline of 16 per cent over reserves of July 31. It is believed that on Sept. 1 half of the gasoline stocks were held in the tanks of five or six refineries in the two states.

Absorption Gasoline Higher

Natural gasoline has continued in demand through the week with fractional price advances on absorption grades. Buying of compression gasoline has been less active and the price of that product has not been changed.

Manufacturers report that they are well sold up for the month and it is difficult to buy any quantity without shopping around and picking up three or four cars one place and one or two another.

One large manufacturer of natural gasoline asserted today that the momentum of the present market will carry it through November without any radical reduction in price. If spot buying continues as active as it has been recently he feels that there is a possibility of further advances.

The large movement of high test gasolines which require a somewhat larger percentage of natural gasoline is one factor which has helped the natural gasoline market in its complete reversal of form since mid-summer.

Kerosene and distillates continue active and strong. Bureau of Mines figures on kerosene stocks for Aug. 31 showed only 19,699,287 gallons and movement is believed to have been greater than production since that time. There is a continued belief that prices will be forced upwards before winter actually sets in. The shortage of light straw prime white distillate is such that some kerosene will probably have to be used as home heating distillates during the winter. Some 42-43 kerosene has been sold for resale during the past day or two at 4¼ cents.

Fuel oil has been the quietest item quoted in the Mid-Continent this week. Prices have not declined further but movement has been slower.

MIDLAND
Better-Than-New-Navy
GASOLINE
Permanently maintained at a definite high standard of quality
Midland Gasoline
has for years been accepted as a better product. You will appreciate its added value, as will your customer
SKELLY OIL COMPANY
El Dorado, Kansas

Refinery Markets On Light Oil Products

Pennsylvania, Oklahoma, North and South Texas, Louisiana, Arkansas

FOLLOWING are the average market prices on the more important petroleum products in cents per gallon f. o. b. in Oklahoma, Texas refinery and Pennsylvania. These are actual prices at which the bulk of each product is moving from the refineries at the present time. Anyone having knowledge of different prices which have obtained on any considerable quantity of any of the products mentioned will greatly favor us by advising us at once.

GASOLINE AND NAPTHA

PENNSYLVANIA	Prices Oct. 15	Prices Oct. 8	Prices Oct. 1
50-52 Naptha	10¼ - 10½	10¾ - 11	10¾ - 11
54 Naptha	10¼ - 10¾	11 - 11¼	11 - 11½
58 Gasoline	11¼ - 11¾	11½ - 12	11¾ - 12
60 Straight-run gasoline	12½ - 13	12¾ - 13	12¾ - 13
62 Straight-run gasoline	13½ - 14	13½ - 14	13½ - 14
64 Straight-run gasoline	14½ - 15	14½ - 15	14½ - 15
68 Straight-run gasoline	18 - 18½	17½ - 18	17 - 18
68-70 Blend, 450 E. P.	10¾ - 11	11 - 11¼	10¼ - 10½
60-62 Blend 450 E. P.	10¾ - 11	11¼ - 11½	10½ - 10¾
62-64 Blend, 450 E. P.	10¾ - 11	11¼ - 11½	10½ - 10¾
66-68 Blend 440 E. P.	11 - 11¼	11¼ - 11½	10½ - 10¾
68-70 Blend, 440 E. P.	11 - 11¼	11¼ - 11½	10½ - 10¾
68-70 Blend, 420 E. P.	11¼ - 11¾	11½ - 12	11 - 11½
OKLAHOMA			
48-50 450 E. P. naptha	6 - 6½	6 - 6½	6 - 6½
50-52 450 E. P naptha	6¼ - 6½	6¼ - 6½	6 - 6½
56-58 450 E. P gasoline	6¼ - 6¾	6¼ - 6½	6 - 6½
55-57 (New Navy), 437 E.P.181i.b.p	6¼ - 6½	6¼ - 6½	6¼ - 6½
58-60 (New Navy), 437 E.P.181i.b.p	6½ - 7	6¾ - 6¾	6½ - 6¾
60-62 400 E. P gasoline	8¼ - 8½	8¼ - 8½	8¼ - 8½
64-66 375 E. P gasoline	9½ - 9¾	9¼ - 9½	9½ - 9½
68-70 350 E. P gasoline	10¾ - 11	10¾ - 11	10½ - 11
NORTH TEXAS			
48-52 450 E. P. naptha	6 - 6½	6¼ - 6½	6 - 6½
56-58 450 E. P. gasoline	6¼ - 6½	6¼ - 6½	6 - 6½
56-58 New Navy gasoline	6½ - 6¾	6½ - 6¾	6¼ - 6½
58-60 New Navy gasoline	6½ - 6¾	6½ - 6¾	6¾ - 6¾
60-62 400 E. P gasoline	8 - 8½	8¼ - 8½	7¾ - 8¼
64-66 390 E. P gasoline	9 - 9¼	9 - 9¼	8½ - 9
64-66 375 E. P. gasoline	9¼ - 9½	9¼ - 9½	8¾ - 9¼
LOUISIANA-ARKANSAS			
51-53 460 E. P. naptha	6¼ - 6¾	6¼ - 6¾	6¼ - 6¾
56-58 450 E. P gasoline	6¼ - 6¾	6¼ - 6¾	6¼ - 6¾
58-60 437 E. P New Navy Gasoline	7 - 7¼	6¾ - 7¼	6¾ - 7
64-66 400 E. P. Gasoline	8½ - 8¾	8½ - 8¾	8¼ - 8¾

NATURAL GASOLINE

OKLAHOMA	Prices Oct. 15	Prices Oct 8	Prices Oct. 1
Grade A, 72-78 375 E. P., 90% Rec	8 - 8¼	7¾ - 8¼	- 7¾
Grade B, 76-82 375 E. P., 85% Rec.	7¾ - 8	7½ - 8	7½ - 7¾
Grade C, 80-88 350 E. P., 78% Rec.	7½ - 7¾	7½ - 7¾	- 7½
Grade D, 88-92 350 E. P.	7½ - 7¾	7½ - 7¾	- 7½
(Motor Natural Gasoline—Blends)			
Grade 1, 58-62 437 E.P., 91% Rec..	6½ - 7	6½ - 7	6½ - 6¾
Grade 2, 58-62 450 E.P., 90% Rec.	6½ - 7	6½ - 7	6½ - 6¾
Grade 3, 66-64 440 E.P., 88% Rec.	6¾ - 7¼	6¾ - 7¼	6¾ - 7
Grade 4, 66-70 435 E.P., 85% Rec.	6¾ - 7¼	6¾ - 7¼	6¾ - 7
NORTH TEXAS			
Grade A, 72-78 Absorption	7¾ - 8¼	7¾ - 8¼	7½ - 7¾
Grade C, 80-88 Compression	7½ - 7¾	7½ - 7¾	7¼ - 7½
(Motor Natural Gasoline—Blends)			
Grade 1, 58-62 437 E. P.	6½ - 6¾	6½ - 6¾	6½ - 6¾
Grade 2, 58-62 450 E. P.	6½ - 6¾	6½ - 6¾	6¼ - 6¾

BURNING OILS

PENNSYLVANIA			
45 Water White	7¼ - 7½	- 7¼	6¾ - 7
46 Water White	7¾ - 8	7¾ - 8	- 7¼
47 Water White	8½	8¼ - 8½	7¾ - 8¼
300 Burning Oil	7½ - 8	7½ - 7¾	7½ - 7¾
OKLAHOMA			
41-43 Water White	3⅞ - 4⅛	3⅞ - 4⅛	3⅞ - 4⅛
42-43 Water White	4 - 4¼	4 - 4¼	4 - 4¼
45-47 Distillate 320 E. P.	5½ - 6	5½ - 6	5½ - 6
46-48 Distillate 300 E. P.	6 - 6¼	6 - 6½	6 - 6½
NORTH TEXAS			
40-42 Prime White Distillate	3½ - 3¾	3½ - 3¾	3½ - 3¾
41-43 Water White Kerosene	3¾ - 4	3¾ - 4	3¾ - 4
LOUISIANA-ARKANSAS			
41-43 Water White Kerosene	4 - 4¼	4 - 4¼	4 - 4¼

(Prices of Lubricants and Heavy Oils are on page 133)

Demand For Oil Products Weaker; Scarcity Holds Price

CHICAGO, Oct. 13.—A demand which was satisfactory for the time of year, characterized the Chicago oil market since the middle of September until this week, when it weakened. Marketers and refiners generally attribute the dullness to the Tulsa convention and believe the business will be better next week. The weather in Standard Oil Co. of Indiana territory has been of a kind to stimulate consumption, and that augurs a good week after the oil men get home from the International Petroleum Congress. Meantime, prices have not changed much.

The market showed strength Friday and Saturday in every item. However that strength was based almost entirely on the fact that supplies in Group 3 were diminishing. Refiners who have wholly or largely discontinued operations, have had a chance to dispose of a great volume of stocks since Sept. 1. Furthermore, there seems little indication now that operations will be increased much before spring. If a refinery ceased to run because it did not pay at the height of the motoring season, it is not likely to start up on the eve of winter when selling prices are about the same and costs are not much less.

Obviously the scarcity of gasoline keeps it firm, for the trade has showed a more lively interest in almost every other refinery product this week. It was still possible for a jobber, buying in large quantities, to get Navy at 6½ cents on Friday but a larger volume was changing hands at 6¾. Refiners who hold out obstinately for 7 cents a gallon are getting it in some cases, but they are mostly out of the spot market. Tank car price reductions do not appear to have been any stimulant to the market and jobbers, as usual, are starting the winter with a great deal of empty space in their tanks to be filled before spring with overages on marginal contracts.

About the only development in the gasoline market was a certain tendency to buy 60-62 gasoline and pay up to 8¼ cents for it. The 58-60 blend which was introduced by two or three firms into Michigan and Wisconsin last winter, enters the market this fall on its merits as a winter product, for the cost of raw natural gasoline in Group 3 has made it necessary to sell the 56-58 blend at about the same price as Navy.

In spite of the fact that kerosene is undergoing some dullness right now scarcity has brought its price up to 4¼ cents in some places. More than a week has passed since the price of kerosene was reduced in tank wagon lots, and the tendency of the product is still upward, although the demand is off. Four cents a gallon is the low price on refined oil. It is not at all difficult to sell kerosene at 4 cents now to any jobber who is in the market, and refiners are declining offers where the buyer hopes to bear the price under that figure.

Distillate for domestic furnaces is still active, especially in the market in larger cities. The volume of trade in domestic fuel, such as the Standard Oil Co. calls "furnace oil," has been good since the first hint of cool weather, and appears to be getting better. There are now seven oil companies in the tank wagon delivery business, serving residences in Chicago, and other towns in the middle west have their proportionate share. The goods are still selling over a wide range, mostly above 3 cents.

Gas Oil on List

After having been the deadest item on the list for weeks, gas oil came to life during the last few days. Inquiries from gas companies were more numerous than during the previous week but orders were small. The going price is between 2¼ and 2½ cents a gallon.

Fuel oil prices too are stronger than last week, the market having thoroughly overcome the depression that followed the cut in the price of Mid-Continent crude. The re-grading of crude hurt

(Concluded on page 135)

Buy BERRY'S Zero Cold Test Lubs

WESTERN AND PENNSYLVANIA NEUTRALS

OLD timers say this is going to be a long cold winter. That means zero cold test lubes will be in the spot light for many months.

Instead of scouring the country by wire and letter for the Western and Pennsylvania neutrals you want, ask Berry's Sons.

Berry's Sons focus the resources of the best sources of supply for zero cold test, Western and Pennsylvania lubricating products so you can get the best of these products when you want them at the market's right price.

Send your lubricating oil inquiry to Berry's Sons to-day

JAMES B. BERRY'S SONS COMPANY

REFINERS and WHOLESALERS
PETROLEUM PRODUCTS

Oil City, Pa: Chicago · New York · Boston · Philadelphia · Tulsa · London, Eng.

Refinery Markets On Lubricants, Heavy Oils

Pennsylvania, Oklahoma, North and South Texas, Louisiana, Arkansas

FOLLOWING are the average market prices on the more important petroleum products in cents per gallon f. o. b. in Oklahoma, Texas refinery and Pennsylvania. These are actual prices at which the bulk of each product is moving from the refineries at the present time. Anyone having knowledge of different prices which have obtained on any considerable quantity of any of the products mentioned will greatly favor us by advising us at once.

CYLINDER OILS

PENNSYLVANIA	Prices Oct.. 15	Prices Oct. 8	Prices Oct. 1
600 Steam Refined	11 -11¼	-11	10½-11
635 Steam Refined	12½-12¾	12½-13	-12½
650 Steam Refined	13½-14	13½-14	13 -13½
600 Flash	16½-17	16 -16½	-16
600 Warren E	-16	-16	15¾-16
600 Oil City E	-14	-14	-14
600 Filtered D	20½-21	20½-21	20 -21
Cold Test Stocks (bright filtered)	33 -34	33 -34	33 -34
Cold Tests Stocks (dark filtered)	31 -32	31 -32	31 -32
Black Oil	-		-
OKLAHOMA			
Bright Filtered Stock	26 -33	26 -33	26 -33
Medium Filtered Stock	16 -17	-17	-17
600 Steamed Refined Olive Green	5½- 6½	5½- 6½	5½- 6½
600 Steam Refined Dark Green	4½- 5½	4½- 5½	4½- 5½
Black Oil	3½- 3¾	3½- 3¾	3½- 3¾

WAX

PENNSYLVANIA (Per Pound New York)			
122-124 White Crude Scale	- 3½	- 3	- 3
124-126 White Crude Scale	3¼- 3½	- 3¼	- 3¼
OKLAHOMA (Per Pound Group 3)			
124-126 White Crude Scale	2¾- 2⅞	2½- 2¾	2½- 2¾

FUEL OIL

PENNSYLVANIA			
36-40 Fuel Oil	5¾- 6¼	5½- 5¾	5½- 6
30-34 Fuel Oil	5½- 5¾	5¼- 5½	- 5¼
OKLAHOMA			
40-42 Prime White Dist	3½- 3¾	3½- 3¾	.....
38-40 Straw Distillate	3½- 3¾	3½- 3¾	3 - 3¼
36-38 Straw Distillate	2¾- 3¼	3¼- 4½	2¾- 3
32-36 Gas Oil (Gal.)	2¾- 2½	2¾- 2½	2¾- 2½
24-26 Fuel Oil (bbl.)	.80- .85	80-85	82½-.87½
Fuel Oil, buyers, cars (bbl.)	.75- .80	75-.80	.80-.85
Road Oils 50-60 Asphaltic Content	.95-1.05	.95-1.05	1.00-1.10
Road Oils 60-70 Asphaltic Content	1.05-1.15	1.05-1.15	1.10-1.20
NORTH TEXAS			
38-40 Straw Distillate	3 - 3¼	3 - 3¼	3 - 3¾
32-36 Gas Oil (gal.)	2¾- 2½	2¼- 2½	2¼- 2½
24-26 Fuel, per bbl	.72½-.80	.70-.80	.75-.80
South Texas Fuel	1.15-1.25	1.15-1.25	1.15-1.25
South Texas Gas Oil	3½- 3¾	3½- 3¾	3 - 3½
LOUISIANA-ARKANSAS			
34-36 Gas Oil (Gal.)	2¾- 3	2¾- 3	2¾- 3
24-26 Fuel Oil (bbl.)	.75- .85	.75- .85	.80- .85

NEUTRAL OILS

PENNSYLVANIA	Prices Oct.. 15	Prices Oct. 8	Prices Oct. 1
(Viscous Test 70)			
200 Vis. No.3 Assoc. Filt	26½-27	26 -27	26½-27
180 Vis. No.3 Assoc. Filt	24½-25	24 -25	24½-25
150 Vis. No.3 Assoc. Filt	22 -22½	21 -22	21½-22
(Non-Viscous)			
34 350-360 Flash	8 - 8½	7½- 8	7½- 8
36 Miners Neutrals 300-305 Flash	7½- 7¾	7¼- 7½	7 - 7½
OKLAHOMA			
(Viscous Test 100)			
70 Vis. at 100°F. No. 2 color	4¼- 4½	4¼- 4½	4¼- 4½
70 Vis. at 100°F. No. 2½-3 color	4 - 4¼	4 - 4¼	4 - 4¼
100 Vis. at 100°F. No. 2 color	5 - 5½	5 - 5½	5 - 5½
100 Vis. at 100°F. No. 2½-3 color	4¾- 5	4¾- 5	4¾- 5
150 Vis. at 100°F. No. 3 color	11½-12	11½-12	11½-12
150 Vis. at 100°F. No. 4 color	11 -11½	11 -11½	11 -11½
180 Vis. at 100°F. No. 3 color	14 -14½	14 -14½	14 -14½
180 Vis. at 100°F. No. 4 color	13¼-13¾	13¼-13¾	13¼-13¾
180 Vis. at 100°F. No. 5 color	12½-13	12½-13	12½-13
180 Vis. at 100°F. No. 6 color	11¾-12¼	11¾-12¼	11¾-12¼
200 Vis. at 100°F. No. 3 color	15 -15½	15 -15½	15 -15½
200 Vis. at 100°F. No. 4 color	14¼-14¾	14¼-14¾	14¼-14¾
200 Vis. at 100°F. No. 5 color	13½-14	13½-14	13½-14
200 Vis. at 100°F. No. 6 color	12¾-13¼	12¾-13¼	12¾-13¼
220 Vis. at 100°F. No. 3 color	16 -16½	16 -16½	16 -16½
220 Vis. at 100°F. No. 4 color	15¼-15¾	15¼-15¾	15¼-15¾
220 Vis. at 100°F. No. 5 color	14½-15	14½-15	14½-15
220 Vis. at 100°F. No. 6 color	13¾-14¼	13¾-14¼	13¾-14¼
240 Vis. at 100°F. No. 3 color	17 -17½	17 -17½	17 -17½
240 Vis. at 100°F. No. 4 color	16¼-16¾	16¼-16¾	16¼-16¾
240 Vis. at 100°F. No. 5 color	15½-16	15½-16	15½-16
240 Vis. at 100°F. No. 6 color	14¾-15¼	14¾-15¼	14¾-15¼
280 Vis. at 100°F. No. 3 color	19½-20	19½-20	19½-20
280 Vis. at 100°F. No. 4 color	18½-19	18½-19	18½-19
280 Vis. at 100°F. No. 5 color	17½-18	17½-18	17½-18
280 Vis. at 100°F. No. 6 color	16½-17	16½-17	16½-17
300 Vis. at 100°F. No. 6 color	17 -18	17 -20	17 -20
SOUTH TEXAS			
(Viscous Test 100; cold test 0)			
100 Vis. No.2 Color Unfilt. Pale	7 - 8	7 - 8	6 - 7
150 Vis. No.2½ Color Unfilt. Pale	9½-10½	9½-10½	9 -10
200 Vis. No.3 Color Unfilt. Pale	10½-11½	10½-11½	10 -11
300 Vis. No.3 Color Unfilt. Pale	13 -14	13 -14	13 -14
500 Vis. No.3½ Color Unfilt. Pale	15 -16	15 -16	15 -16
750 Vis. No.4 Color Unfilt. Pale	22 -23	22 -23	22 -23
200 Vis. No. 2 Filt. Pale	-22	-22	-22
300 Vis. No. 2 Color Filt. Pale	-24	-24	-24
500 Vis. No. 2½ Color Filt. Pale	-28	-28	-28
750 Vis. No. 2½ Color Filt. Pale	-37	-37	-37
200 Vis. No. 5½ Color Red Oil	9 -10	9 -10	9 -10
300 Vis. No. 5½ Color Red Oil	11 -12	11 -12	11 -12
500 Vis. No. 6 Color Red Oil	13½-15	13½-15	13½-15
750 Vis. No. 6 Color Red Oil	19½-20	19½-20	19½-20

Kerosene And Lubes Continue Strong In Pennsylvania

(Refinery Market Prices, pp. 131-133)

CLEVELAND, Oct. 15.—Kerosene and cylinder stocks continue to be the strongest features of the western Pennsylvania gasoline market. Prices are firm and some refiners report they are unable to keep abreast the orders that are coming although they are running their plants at their full rated capacity.

There is an actual scarcity of 45 water white and several refiners report they are sold up over October and the first week of November. Fuel oil also is active and prices are higher than a week ago. The demand for fuel is coming from both domestic and industrial consumers. Because of the growing use of oil burners in home heating plants, jobbers in western New York state are adding light fuel oils to their list of merchandise.

Steam refined stocks are strong and demand for filtered goods strengthened during the week While some 600 steam refined was quoted at 10½ cents the larger producers were asking 11 and 11¼ cents. Prices for export have advanced in New York and a fair amount of export business was being done at the higher level. On 650 steam refined most refiners were asking 13½ to 14 but some was moved at 15 cents by one refiner in the Oil City district.

The market for viscous neutrals was mixed. Some refiners said the demand was active but others reported that buying was rather slow. The largest Independent manufacturer of these oils was quoting 29 cents on 220 viscosity No. 3 color while this price was asked by one refiner for 200 viscosity. For the latter grade the majority was asking 26½ to 27 cents but some was available at 26 cents. For 150 viscosity, prices ranged from 20 to 22½ cents with the largest manufacturers quoting 22 and 22½. Non-viscous neutrals were stronger due to a good sized demand and small output. Several refiners are running these oils into fuel because of the active market for the latter.

Spot gasoline was comparatively slow. Quotations on 58-60 were ¼ cent lower than a week ago but the higher gravity grades were firmer and prices were pretty well maintained. One refiner reported sales over the week a cent or more above the general market. Sixty gravity was moved at 13½ cents, 62 at 14½ and 64 at 15¾, his sales record showed. Blends were easier.

White crude scale is active and strong. Prices are ⅛ cent a pound higher than a week ago.

Kentucky

Better movement of gasoline was in progress today in central Kentucky with prices firm. Demand for high gravity motor fuel has resulted in a ¼ cent advance of 68 to 13¾ cents. Quotations on other grades in central Kentucky were: 58-60, 9; 60-62, 11½; 62-64, 12; 64-66, 12½, and 66-68, 13 cents. At Louisville Navy was quoted at 9 to 9¼ cents and in the Cincinnati district 11 cents.

Kerosene is strong and active at 6¼ to 6½ cents. Fuel oil trade gave evidence of a pick-up. Quotations for 24-26 central Kentucky were 3⅝ to 3¾ cents; 4 cents at Louisville and 5 cents at Cincinnati. Gas oil movement is holding steady, the price being 4¼ to 4½ cents, central Kentucky and 5 cents at Louisville.

natural gasoline

grade "a"

GRAVITY.....Not below 72° Be.
Not above 78° Be.
E. P.....Not over 375° F.
RECOVERY.....Not less than 90%

grade "b"

GRAVITY.....Not below 76° Be.
Not above 82° Be.
E. P.....Not over 375° F.
RECOVERY.....Not less than 85%

grade "c"

GRAVITY.....Not below 80° Be.
Not above 88° Be.
E. P.....Not above 350° F.
RECOVERY.....Not less than 78%

grade "d"

GRAVITY.....Not below 88° Be.
Not above 92° Be.
E. P.....Not above 350° F.

The demand for Natural Gasoline is very strong. Stocks have been reduced to the daily plant production.

All good winter motor gasoline should contain a certain percentage of Natural Gasoline. The experienced auto driver wants it because it makes his engine start promptly even in the coldest weather.

Let us protect your fall and winter's supply of Natural Gasoline. Our large daily production and car supply put us in a position to serve your needs promptly at all times.

C & S CORPORATION

grade "1"

GRAVITY.....Not below 58° Be.
Not above 6.° Be.
E. P.....Not over 437° F.
RECOVERY.....Not less than 9.%

grade "2"

GRAVITY.....Not below 58° Be.
Not above 6.° Be.
E. P.....Not over 450° F.
RECOVERY.....Not less than 90%

grade "3"

GRAVITY.....Not below 64° Be.
Not above 60° Be.
E. P.....Not over 440° F.
RECOVERY.....Not less than 88%

grade "4"

GRAVITY.....Not under 66° Be.
Not over 70° Be.
E. P.....Not over 43.° F.
RECOVERY.....Not less than 8.%

CHESTNUT & SMITH CORPORATION

GENERAL OFFICES ~ CHESTNUT & SMITH BLDG. ~ TULSA OKLA.

Tank Wagon, Service Station Markets
Gasoline and Kerosene

BELOW are given in cents a gallon, the tank wagon price of gasoline without the special taxes levied against motor fuels by many states the amount of the state taxes, the total tank wagon price with tax added in, and the service station or retail price of gasoline as quoted in the various Standard Oil marketing territories The right hand column is the tank wagon price of kerosene. By tank wagon price is meant the price to resale agents or dealers. Usually this price does not apply to sales to consumers from tank wagons.

Prices in Effect Oct. 15

S. O. NEW JERSEY TERRITORY

	Gasoline T.W.	Tax	Total	S.S.	Oil T.W.
Atlantic City N. J.	18.5	0	18.5	*	13
Newark, N. J.	18.5	0	18.5	*	13
Annapolis, Md.	18	1	19	*	13
Baltimore, Md.	18	1	19	22	12
Cumberland, Md.	18	1	19	22	14
Washington, D. C.	18	0	18	21	12.5
Danville, Va.	18	3	21	*	14
Norfolk, Va.	17	3	20	22	12
Richmond, Va.	18	3	21	24	12.5
Roanoke, Va.	18	3	21	24	14
Petersburg, Va.	18	3	21	*	13.5
Charleston, W. Va.	18	2	20	23	12 5
Clarksburg, W. Va.	18	2	20	*	13.5
Keyser, W. Va.	18	2	20	*	14
Parkersburg, W. Va.	17	2	19	*	11
Wheeling, W. Va.	18	2	20	23	12.5
Williamson, W Va.	19.5	2	21.5	*	14
Charlotte, N. C.	18	3	21	24	13.5
Hickory, N. C.	18.5	3	21.5	*	14
High Point, N. C.	18	3	21	*	14
Mt. Airy, N. C.	18	3	21	*	13.5
Salisbury, N. C.	18.5	3	21.5	*	14
Charleston, S. C.	16	3	19	22	11.5
Columbia, S. C.	18	3	21	23	13.5

*Dealers set own prices. S. O. New Jersey does not operate station.

S. O. NEW YORK TERRITORY

*New York City	18.5	0	18.5	21	14
Albany, N. Y.	17	0	17	19	13
Buffalo, N. Y.	16	0	16	18	14
Rochester, N. Y.	15	0	15	19	13
Syracuse, N. Y.	16	0	16	18	11
Boston, Mass.	18.5	0	18.5	21	12

*In steel barrels.

ATLANTIC REFINING TERRITORY

Pittsburgh, Pa.	18	0	18	23*	14
Philadelphia, Pa.	18	0	18	23*	14
Allentown, Pa.	18	0	18	23*	14
Scranton, Pa.	17	0	17	22*	14
Dover, Del.	18	1	19	22	14
Wilmington, Del.	18	1	19	22	14
Providence, R. I.	18.5	0	18.5	21	14
Springfield, Mass.	18 5	0	18.5	21	14
Worcester, Mass.	18 5	0	18 5	21	14
Hartford, Conn.	18.5	1	19.5	22	14
New Haven, Conn.	18.5	1	19.5	22	14
Boston, Mass.	18.5	0	18.5	21	14

Last six cities are Atlantic's chief marketing points in New England. S. O. New York markets there also.

*Contains 2-cent tax collected by dealer and paid by him directly to state.

S. O. OHIO TERRITORY

All Ohio points	17	0	17	19	13

S. O. KENTUCKY TERRITORY

Lexington, Ky.	16	1	17	19	14
Louisville, Ky.	15	1	16	18	13
Covington, Ky	16	1	17	19	13
Clarksdale, Miss.	15	1	16	18	13
Jackson, Miss.	14	1	15	17	10
Natchez, Miss.	14.5	1	15.5	17.5	12.5
Vicksburg, Miss.	14.5	1	15.5	17.5	12.5
Birmingham, Ala.	16	2	18	20	14.5
Mobile, Ala.	15	2	17	19	13.5
Montgomery, Ala.	16	2	18	20	15
Atlanta, Ga.	17	3	20	22	15
Augusta, Ga.	17	3	20	22	14
Macon, Ga.	17	3	20	22	14.5
Savannah, Ga.	15	3	18	20	13
Jacksonville, Fla.	15	3	18	20	13
Miami, Fla.	17	3	20	22	14.5
Tampa, Fla.	15	3	18	20	13
Pensacola, Fla.	15	3	18	20	13.5

S. O. CALIFORNIA TERRITORY

Phoenix, Ariz.	16	3	19	22	21.5
Los Angeles, Cal.	10	2	12	15	15.5
Fresno, Cal.	11.5	2	13.5	16.5	17 5
San Francisco, Cal.	11	2	13	16	15 5
Reno, Nev.	14.5	2	16.5	19.5	19
Portland, Ore.	12	3	15	18	16 5
Seattle, Wash.	12	1	13	16	16 5
Spokane, Wash.	16	1	17	20	20 5
Tacoma, Wash.	12	1	13	16	16.5

S. O. LOUISIANA TERRITORY

	Gasoline T.W.	Tax	Total	S.S.	Oil T.W.
Camden, Ark.	14.5	3	17.5	20.5	12
Little Rock, Ark.	14.5	3	17.5	20.5	12
West Helena, Ark.	14 5	3	17.5	20.5	12
Alexandria, La.	13.5	1	14.5	17.5	12
Baton Rouge, La.	12	1	13	16	10.5
Lake Charles, La.	13.5	1	14.5	17.5	12
New Orleans, La.	12.5	1	13.5	16.5	11
Shreveport, La.	13.5	1	14.5	17.5	12
Bristol, Tenn.	16	2	18	21	14.5
Chattanooga, Tenn.	14.5	2	16.5	19.5	13.5
Knoxville, Tenn.	15.5	2	17.5	20.5	14
Nashville, Tenn.	14.5	2	16.5	19.5	13.5
Memphis, Tenn.	14	2	16	19	13

MAGNOLIA PETROLEUM TERRITORY

Muskogee, Okla.	11	1	12	16	9
Oklahoma City	13	1	14	16	9
Tulsa, Okla.	10	1	11	14	9
Fort Smith, Ark.	12.5	3	15.5	18.5	11
Little Rock, Ark.	14	3	17	20	12
Texarkana, Ark.	14	3	17	20	11
Dallas, Tex.	6	1	7	10	10
El Paso, Tex.	11	1	12	17	12
Fort Worth, Tex.	6	1	7	9	10
Houston, Tex.	14	1	15	18	11
San Antonio, Tex.	6	1	7	10	11

S. O. INDIANA TERRITORY

Chicago, Ill.	13.4	0	13.4	15.4	10
Decatur, Ill.	14.2	0	14.2	16.2	10.5
East St. Louis, Ill.	12.85	0	12.85	15 1	9.6
Joliet, Ill.	13.4	0	13.4	15.4	10.7
Peoria, Ill.	14.2	0	14.2	16.2	10.5
Quincy, Ill.	14	0	14	16	10.3
Evansville, Ind.	14	2	16	18	10.5
Indianapolis, Ind.	14.2	2	16.2	18.2	10.7
South Bend, Ind.	14.4	2	16.4	18.4	10.9
Detroit, Mich.	12.8	0	12.8	14.8	11.2
Grand Rapids, Mich.	14.7	0	14.7	16.7	11 1
Saginaw, Mich.	14.9	0	14.9	16.9	11.3
La Crosse, Wis.	15.2	0	15.2	17.2	11.4
Madison, Wis.	14.3	0	14.3	16.3	10.5
Milwaukee, Wis.	14	0	14	16	10.2
Duluth, Minn.	15.2	0	15.2	17.2	11.6
Mankato, Minn.	14.8	0	14.8	16.8	11.4
Minneapolis, Minn.	12.9	0	12.9	14.9	11.6
Davenport, Ia.	14.5	0	14.5	16.5	10 9
Des Moines, Ia.	12.5	0	12.5	14.5	10.9
Sioux City, Ia.	14	0	14	16	10.5
Kansas City, Mo.*	11.9	1	12.9	14.9	9.3
St. Joseph, Mo.**	13.8	.5	14.3	16.3	10 2
St. Louis, Mo.	12.1	0	12 1	14 4	10
Fargo, N. D.	15.6	1	16.6	18.6	13.6
Grand Forks, N. D.	17 6	1	18.6	20.6	13 9
Minot, N. D.	19.4	1	20.4	22.4	13.6
Huron, S. D.	14	2	16	16	12.1
Pierre, S. D.	14	2	16	16	12 1
Wichita, Kan.	13.8	0	13.8	15.8	9.8
Bartlesville, Okla.	12.9	1	13.9	15.9	8.9

*Kansas City tax of 1 cent imposed by city.
**St. Joseph tax of ½ cent imposed by city.

S. O. NEBRASKA TERRITORY

Crawford, Neb.	15	0	15	*	13
Omaha, Neb.	14.25	0	14.25	16.25	11.75

*Standard has no service station here.

CONTINENTAL OIL TERRITORY

Denver, Colo.	13	2	15	17	13.5
Glenwood Sp'gs, Colo.	19	2	21	*	16.5
Pueblo, Colo.	15	2	17	19	12.5
Basin, Wyo.	15	1	16		13
Casper, Wyo.	13	1	14	16	11
Cheyenne, Wyo.	15.5	1	16.5	17.5	13
Cody, Wyo.	16	1	17	*	14
Lander, Wyo.	15	1	16	*	13
Billings, Mont.	17.5	2	19.5	21.5	14.5
Butte, Mont.	19	2	21	23	15
Great Falls, Mont.	19	2	21	23	16
Helena, Mont.	19	2	21	23	16
Miles City, Mont.	18 5	2	20.5	22.5	15 5
Ogden, Utah	18 5	2.5	21	23	15 5
Salt Lake City, Utah	18.5	2.5	21	23	15 5
Boise, Ida.	18	2	20	22	18
Albuquerque, N. M.	17	1	18	20	15 5

*Continental has no service stations at these points.

Demand For Oil Products

(Continued from page 131)

the fuel oil market especially because it automatically made the contract price of much Mid-Continent 24-26 fuel 60 per cent of the price of 33-39.9 crude, which is posted at $1.30 a barrel. Now 80 cents is the bottom price for spot Oklahoma fuel and some refiners are withdrawing quotations under 85.

About the only 80-cent fuel oil on the Chicago market now is a product of the Arkansas and Louisiana fields which usually runs 5 cents cheaper than goods of the same gravity from Oklahoma and Kansas. Even treated Smackover crude oil is scarce in the fuel market under 70 cents, and the industrial demand for the product has developed remarkably during the past summer.

This is the season of the year for buying zero cold test lubricants and the demand has been good. The jobbing trade with compounding plants was active in the local market this week. Other lubes gained strength by induction, aided some by reports of their scarcity.

Week's Price Changes Tank Wagon Market

DENVER, Oct. 15.—Continental Oil Co. today reduced tank wagon price of kerosene 1 cent in Montana, Idaho, Utah, Colorado and Wyoming except Cheyenne where the reduction was ½ cent and Denver where no change was made. Gasoline tank wagon and service station prices were reduced 1 cent at Utah points today, and 2 cents Oct. 12 in Denver. Gasoline tank wagon only has been advanced 1 cent at Cheyenne.

* * *

TULSA, Oct. 15.—Magnolia Petroleum Co. Oct. 11 reduced gasoline service station only 1 cent at Fort Worth and Oct. 13 tank wagon and service prices 3 cents at San Antonio.

Another Fair Week Seen By Weather Man

CHICAGO, Oct. 14.—Except for a little cool weather on Monday, in the central Mississippi river valley, prevailing temperatures will be normal or slightly above for all of the Chicago forecast district, including Standard Oil Co. of Indiana territory, Oct. 15 to 20. The weather man further predicts that the days will be fair and pleasant.

Last week was all that any motorist could ask for, in the way of weather. There was little rainfall east of the Mississippi river. There were showers on the Gulf coast nearly every day and it rained in New England on Thursday and in Chicago on Saturday, but the interior was dry. West of the river there was more rainfall, in the northwest the first part of the week and in the southwest in the latter part.

The weather could truthfully be called balmy, temperatures being far above seasonal average at times. Even yet it is said there is no abnormally cold weather in sight, and the consumption of gasoline may reasonably be expected to keep up its present rate for several days.

Buyers Fail To Respond To Cut In Gasoline Export Prices

By Special Correspondent

NEW YORK, Oct. 15.

ANNOUNCEMENT of ½ cent reduction in gasoline export prices Oct. 9 failed to bring forth any heavy buying early in the week, but considerable business was closed Thursday and were it not for the fact that the trade observed Friday as a holiday, many good sized dealings might have been closed, as there was a good steady inquiry from both the United Kingdom and continental Europe.

It was persistently reported in local circles that the Atlantic Refining Co. had received an order for 35,000 barrels of new Navy and 64 gravity gasoline, which will be shipped to France during the first half of November. Prices were not divulged. One of the large Independents sold 30,000 barrels of Navy and 64 gravity gasoline for nearby shipment to France out of the Gulf. It is said that 11 cents was paid for the 64 and 8 cents for Navy. Several observers look for more sizable orders this week, as negotiations for some good sized business have been in progress. British buyers are looking around in a more interested way, and there were several rumors current of cargo sales, but nothing definite was heard of. Local refiners feel that the French are the best prospects just now. Stocks in France are much lighter than a few weeks ago, according to returning oil men, and the big distributors are endeavoring to replenish their supplies. Hand-to-mouth buying, however, is still favored by some of the big foreign marketers who feel that they will be able to secure better terms after cold weather has set in.

Reports of Concessions

There were reports current of additional cargo offerings in these parts at 9½ cents per gallon or 3 cents below the quotations posted by the leading refiners. Many buyers consider the quotations of the big refiners to be entirely nominal as business is being done below those quotations.

There has been a marked improvement in the export demand for dark and filtered Pennsylvania cylinder stocks. No really good sized sales are reported but foreign buyers are gradually expanding their operations. Whereas they recently purchased about one fourth of the quantities they normally took, they are now contracting for about one half, and in many instances two thirds. Both the United Kingdom and the continent are taking western bright stocks. Pennsylvania 600 s. r. is moving more freely and sales ranging from 500 to 1000 barrels are more numerous. This oil is bringing from 18 to 19 cents in barrels, New York, the outside price being the more general.

Bunker oil remained easy last week, and the belief prevails in many quarters that the price of this oil will fall shortly. All of the big refiners are asking $1.45 a barrel f. o. b. New York harbor refinery but there were rumors that business was going on a trifle below this figure. Export inquiries for bunker oil were more numerous but no sales to speak of came to the surface. Stocks are large and the recent cut in California crude has created a rather pessimistic feeling among local refiners. Considerable oil is being delivered against old contracts which is keeping the refining element fairly busy.

Gas Oil is Quiet

Gas oil passed a very quiet week. There was little animation in local circles and 36-40 is still quoted at 4 cents a gallon in bulk at the refinery while some buyers believed that this figure might have been shaded a little on a firm bid for a fair sized quantity. At the Gulf 26-28 was quoted at 2¾ cents while the belief prevailed that 2½ and possibly lower could have been done on a fair sized order. There was a rumor of a sale of this oil to a British buyer at 2½ cents but confirmation was lacking. Foreign buyers believe that this oil will go lower soon.

New York Market

The following prices are quoted by eastern seaboard independent refineries on products which are manufactured from Mexican crude transported from Tampico to the refinery by tanker and from California crude.

	Oct. 15
*Gasoline (New Navy) gal., Tank Cars	11½-11¾
‡Bunker oil (F.O.B.New York) bbl.	1.45
Gas Oil (36-40 refinery) gal.	.04
†Kerosene, 45-150 W.W.Bulk Del.,N.Y.nom.	.06

*Delivered.
†Nominal.
‡Plus .06½ charge lighterage.

Export Markets

Furnished to N. Y. Produce Exchange by big exporting oil companies. No actual sales. Record for statistical purposes only.

Illuminating Oils

	Oct.. 15	Oct. 8
Bulk, gal., Bayonne	5 50	5 50
Barrels, gal., Bayonne, cargo	12.50	12 50
Cases, gal., Bayonne	15.40	15.40

Prices for water white oil (150 test) are 1 cent higher than those for standard white.

Gasoline-Naptha
(Cents per Gallon)

U. S. Navy, dead bulk	11.50	12.00
U. S. Navy, cases	25.15	25.65
Export grade, bulk	12.50	13.00
63-66 deg. bulk	14.50	15.00
63-68 deg. bulk	16.00	16.50

Tide Water Oil Company
(f. o. b. Bayonne)

59-60 deg. bulk	12.50	13.00
59-61 deg. cases	25.15	25.65
Export grade, Navy Specifications bulk	11.50	12.00
63-65 deg. bulk	14.50	15.00
68-72 deg. bulk	17.00	17.50

	Bulk	Barrels	Cases
Standard white 110	5.50	12.50	15.40
Water white 150	6.50	13.50	16.40

The Texas Company

Gasoline, cases		25.15	25.65
Kerosene	**Bulk**	**Barrels**	**Cases**
Standard White	5.50	12.50	15.40
Prime White	6.00	13.00	15.90
Water White	6.50	13.50	16.40

The waxes were in better export demand with orders chiefly for 100 to 300 tons. Prices were a trifle firmer at unchanged levels, British buyers are showing a more active interest but are confining their purchases to rather small quantities. Match waxes were in slightly better demand with Scandinavian and Japanese buyers showing interest. Fully refined waxes were dull.

Medicinal oils are offered more freely. Russian oil is fairly plentiful. Domestic medicinal oils are unchanged in price but are enjoying a better demand.

Petrolatums are quiet. Snow white is held at 11¾ to 12 cents while lily white is quoted at 9½ cents with some factors asking as high as 10 cents. Foreign buyers have been showing a keener interest in the market and there is a better outlook.

British Importations

Importations of petroleum into the United Kingdom during the week ended Sept. 24 amounted to 24,773,456 gallons. The larger receipts at London included 1,325,710 gallons of crude oil to the Shell Marketing Co. from Tampico; 330,740 gallons of gas oil from Port Arthur; 653,200 gallons of kerosene from Tampico, both to the Anglo-Mexican Petroleum Co.; 1,222,100 gallons of fuel oil to the Anglo American Oil Co., Ltd., from Baltimore.

The only large arrival at Hull included 665,550 gallons of gas oil to the Anglo Mexican Petroleum Co. from Port Arthur and 184,600 gallons of kerosene to the same concern from Tampico. At Manchester the Anglo-American Oil Co., Ltd., received 1,846,000 gallons of gasoline from Baton Rouge and 174,470 gallons of lubricating oil from New York.

At Swansea the National Oil Refineries received the six shipments of crude oil from Abadan totaling 14,683,510 gallons.

Receipts at Cardiff were very small but at Liverpool, considerable oil arrived although chiefly in small quantities the largest being 44,390 gallons of fuel oil to the Anglo-Mexican Petroleum Co. from Tampico. Glasgow receipts were small while at Barrow the only shipment to arrive was credited to the Shell Marketing Co. and included 58,100 gallons of fuel oil from Tampico.

North Texas Gasolines Show Strength

(Complete Refinery Prices, pp 131-133)

WICHITA FALLS, Oct. 13.—Remarkable strength has been shown by the gasoline markets in north Texas during the week closing today. High test products, depleted by recent export buying, are being quoted at substantial increases in price. It is impossible to buy 64-66, 375 end point, at less than 9¼ cents a gallon and much is moving at ¼ cent above that.

Navy gasoline has strengthened as well. Many buyers are unable to fill their needs for immediate shipment at less than 6¾ cents a gallon. All plants seem to be well supplied with orders.

Natural gasolines have remained steady in price with demand being better on absorption in the Breckinridge district. Compression grades in north Texas are somewhat quieter.

Fuel oil seems to be in a little better position. Refiners have been mov-

ing out their stocks in good shape and are getting in a better position to hold the market. Reductions in crude prices by The Texas Co. and Magnolia have not affected the market adversely. On the contrary the announcement that these companies would take 100 per cent of the oil offered them and will pay producers for oil now in storage to their account has tightened the spot crude market perceptibly. It seems possible that a small premium on crude may appear if crude is kept cleaned up and operators are able to get money for all of their production.

Situation In Kansas Is Unchanged

(Complete Refinery Prices, pp 131-133)

WICHITA, KAN., Oct. 13.—The general situation in the petroleum market in this territory remains unchanged from a week ago, and the quantity of gasoline available is not large. Distress gasoline recently available is practically eliminated, but with offerings so free out of Gulf Coast refineries, the general trend of prices has not been upward for gasoline marketed out of this district to northern points.

A recent survey of the Kansas situation shows that of the 41 refineries in the state, with a combined capacity of 116,200 barrels a day, there is being run to the stills a total daily of approximately 55,855 barrels, or a little more than 35 per cent of normal. Twenty of the 41 refineries shut down and the remainder, with one or two exceptions, operating at greatly reduced capacity.

Refiners in this territory report that while the larger jobbers realize that the law of averages will prevail, and while the last year has not been a particularly profitable one in operating under marginal contracts, they have continued to renew with the smaller jobber holding out. However, the recent turn of events has caused a rather heavy rush for contract protection, with the result that some who have not had a particularly good reputation with reference to living up to contract agreements are experiencing some trouble in getting the desired protection.

While kerosene seems to be exceedingly scarce in this territory, there seems to be little change in price, in fact, the same condition seems to prevail with reference to fuel oil.

Owing to the rather late arrival of cold weather the distillate demand and price has remained rather weak. This is to be expected, however, and with the advent of cold weather both are expected to pick up materially.

La.-Ark. Markets Quieter

(complete Refinery Prices, pp. 131-133)

SHREVEPORT, Oct. 13.—Arkansas and Louisiana markets have been quieter during the week just closed. Prices on gasoline are somewhat softer as a result of the smaller business. Kerosene is active at 4 to 4¼ cents a gallon. Gas oil is steady at 2¾ to 3 cents. Refinery fuel oil is selling at 75 cents at some plants.

Refiners' and Jobbers' Supplies

Following are the average market prices for the week on the principal materials used by refiners and jobbers, f. o. b. shipping point as effective this date

	Oct. 15	Oct. 8
***Benzol**		
Pure Water White, Tanks....gal.	—.24	$—.27
Drums....gal.	—.29	—.32
90%.....Tanks....gal.	—.22	—.25
Drums...gal.	—.27	—.30
Refiners' Supplies		
Soda Ash light 58%...cwt.	$1.45-1.75	$1.45-1.75
Silicate of Soda 60 deg....Bbls.....cwt.	-2.00	-2.00
Sal. Soda wks.....cwt.	1.10-1.30	1.10-1.30
Caustic Soda 76%....cwt.	3.16-3.30	3.16-3.30
Chloride of Lime solid cwt.	1.50-1.75	-1.50
Sulphuric Acid 60 deg. tank cars f. o. b. shipping point.....per ton	9.00-11.00	9.00-11.00
Jobbers' Supplies (Open Market)		
Vegetable Oils—		
*Linseed, carloads Spot..gal.	-.95	-.95
October.....gal.	-.95	-.94
Nov.-Dec.....gal.	-.93	.92
Jan. Forwards.....	-.91	.90
Less carload Spot.....gal.	-.98	-.98
5 Bbls. or less Spot....gal.	-1.01	-1.01
Boiled, tank Spot.....gal.	-.91	.91
Boiled, carloads Spot..gal.	.97	-.93
Soya Bean Spot, Tanks.....lb.	-09½	-.09½
Animal Oils—		
English Degras.....lb.	$-.04¾	$-.04¾
Domestic Degras, bbls. carloads.....lb.	-.04	-.04
*Horse.....lb.	-.08	-.08
Oleic Acid—		
Dist.....lb.	-.09½	-.09½
Saponified.....lb.	-.09½	-.09½
Lard Oils—		
Prime Winter Strained . 1 to 1½ffa. 40/45c.t.lb.	$.15¼	$.15¼
Extra Winter Strained . 2 to 4½ffa. 40/45c.t.lb.	.15¼	.15¼
Extra..... 4 to 5 ffa. 40/45c.t.lb.	.12¾	.12¾
Extra No. 1..... 7 to 10 ffa. 40/50c.t.lb.	.11	.11
No. 1.....15 to 18 ffa. 40/45c.t.lb.	.10½	.10½
No. 2.....22 to 28 ffa. 40/45c.t.lb.	.10	.10
Prime Edible Tallow under 1¾ ffa. 40/45c t. N. Y.....lb.	-.09	.09
Tallow acidless.....lb.	-.11½	.11½
Lard Stearine.....lb.	-.16¼	.16
Oleo Stearine.....lb.	.13	.13
Neatsfoot Oil—		
Pure.....bbls.-lb.	15¾	15¾
Extra.....do lb.	11	11
No. 1.....do lb.	10½	10½
Cold pressed.....lb.	16¾	16¾
Fish Oils—		
Menhaden Oil Light pressed.....gal.	$.65-	-.65
White.....gal.	-.70	-.69
Yellow bleached.....gal.	-.68	-.67
*Herring, tank cars coast gal.	-.40	-.40
Whale, extra winter bleached.....gal.	.81	.81
Seal.....	Nominal	
Naval Stores—		
Turpentine, N. Y.....gal.	1.04	.98
Turpentine†.....gal.	.96¼	.92½
Rosin B. N. Y.....Bbl.	$ 5.85	$ 5.85
Rosin F. N. Y.....Bbl.	$ 5.85	$ 5.85
Rosin B.†.....Bbl.	$ 4.62½	$ 4.45
Rosin F.†.....Bbl.	$ 4.62½	$ 4.45
Rosin Oil 1st run.....gal.	.44	.42
Rosin Oil 2nd. run.....gal.	.46	.48
Pine Tar—		
Kiln Burnt.....Bbl.	11.00	11.00
Retort.....Bbl.	11.00	11.00

†Savannah, Ga., market.
‡Carlots.
*Nominal.

Refiners', Compounders' Supplies Quiet

By Special Correspondent

NEW YORK, Oct. 15.—Most of the supplies were quiet last week, due in part to the holiday on Friday. There was a firmer tone to linseed oil but no further advances were recorded. Spot and October raw oil in carlots cooperage basis is held at 95 cents a gallon while November-December is quoted at 93 cents and January-forward at 91 cents. Consumers consider these prices too high and are not inclined to purchase much oil. A good deal of the trading was confined to limited quantities.

Other vegetable oils were quiet. Soya bean oil is marking time at 9¼ to 9½ cents a pound in tank cars on spot. Stocks on spot are not large and holders refuse to make concessions in order to stimulate buying.

Crude menhaden oil is still quoted at 47½ cents a gallon in tank cars at the factory but buyers of this oil also maintain that the price is too high. Light pressed oil was in fairly good demand at 65 cents in barrels, New York, but stocks are not very large at present. Whale oil was dull while there was not much interest in the other fish oils.

The animal oils were a trifle easier in tone. Demand for neatsfoot and oleo oils lagged throughout the week, while stearic acid was flat and somewhat easier in tone. Oleic acid was very quiet and buyers showed little interest. Foreign inquiries for lard oil were numerous but orders from abroad were scarce. Degras held up fairly well although one or two small sellers seem more inclined to press sales. Horse oil was flat and featureless no trading of consequence being reported. Stearine was steady but dull.

Naval stores were steady to firm last week. Spirits of turpentine moved into higher ground and on Saturday the market closed at $1.04 a gallon in wooden barrels ex yard. Export demand was poor but advices from the primary markets were more bullish in tone and local holders feel confident that the market will resume the upward movement as spot stocks are small. Buyers on the other hand are purchasing in a cautious way feeling that the present prices are not justified. Rosin was dull and devoid of new feature last week.

The chemicals remained quiet. Bleaching powder was a trifle firmer in tone but unchanged in price. Some of the larger buyers are more inclined to anticipate and the movement, last week, was fair. Benzol was steady and demand was rather spasmodic. Stocks are fairly large. Soda ash was in light routine demand and no export trading to speak of came to light. Caustic soda is moving in a fair way on contracts. Export buying is more active. Sulfuric acid was dull.

WRIGHT, IOWA, Oct. 11.—Carl Unsicker is considering the organization of a jobbing company here. It is the plan to have both bulk and service stations.

Crude Oil Prices All Fields

EASTERN FIELDS

	1923 Oct. 15	1922 High		1922 Low		1921 High		1921 Low	
Bradford—Allegany	$2 75	Jan 1	$4 00	July 19	$3.00	Jan 1	$6 10	June 29	$2 25
Other Pennsylvania	2.50	Jan 1	4 00	July 19	3 00	Jan 1	6 10	June 29	2 25
Cabell	1 35	Jan 1	2 61	July 19	1 86	Jan 1	4 46	June 29	1 11
Corning	1 45	Jan 1	2 40	July 20	1.75	Jan 1	4 00	June 29	1 20
Somerset	1 25	Jan 1	2 40	July 19	1 65	Jan 1	4 50	June 29	1.00
Somerset Light	1 40	Jan 1	2 65	July 19	1 90	Jan 1	4 25	June 29	.90
Ragland	75	Jan 1	1 25	July 19	1.00	Jan 1	2.60	June 29	.60

Somerset oil run on and after Oct 1, 1922, takes price of 6 cents higher than above quotation

CENTRAL STATES FIELDS

Wooster	$1 50	Jan 1	$2 70	Sept 21	$1.90	Jan 1	$4 95	June 27	$1 80
Lima	1.68	Jan 1	2 48	July 20	1.98	Jan 1	3.73	June 27	1 58
Indiana	1 48	Jan 1	2 28	July 20	1 78	Jan 1	3 63	June 27	1 38
Princeton	1 47	Jan 1	2 27	July 20	1.77	Jan 1	3 77	June 27	1 27
Lodi	1 50	Jan 1	2 70	July 20	1.90	Jan 1	4 00	June 27	1 80
Illinois	1 47	Jan 1	2 27	July 20	1 77	Jan 1	3 77	June 27	1 27
Waterloo, Ill	95	Jan 1	1 75	July 20	1 25	Jan 1	1 75	June 27	.75
Plymouth	.85	Jan 1	1 65	July 20	1.15	Jan 1	3 48	June 27	.65
Canadian Petrolia	2 08	Jan 1	2 88	July 20	2 38	Jan 1	4 13	June 27	1.98
Western Ky.	1 25	Jan 1	2 40	July 19	1 65	Dec 1	2.40	June 27	.58

MID-CONTINENT AND NORTH TEXAS FIELDS

Below 33	.90	Currie	1.00
33-39 9	1 90	Mexia	1.00
40 and above	1.75	Powell	1.00

Magnolia's Price Schedule in Texas

Under 28	.50	40 and above	1.25
28-30.9	.70	Corsicana, light*	1.00
31-32 9	.90	Corsicana heavy	.50
33-39.9	1.10	Thrall	1.00

*Including Powell

HUMBLE O. & R. PRICES
(Ranger and Burkburnett)

Below 30	.90	36-38.9	1.35
30-32.9	1.10	39 and above	1.40
33-35.9	1.20		

TEXAS CO. PRICES
(North and North Cent. Texas)

Below 33	.90	40 and above	1.25
33-39.9	1.10		

NORTH LOUISIANA-ARKANSAS FIELDS

Caddo, 38 degrees and above	$1.25	El Dorado, below 33	1.10
do 35 to 37.9	1.15	Bull Bayou, 38 and above	1.15
do 32 to 34.9	1.10	do 35 to 37.9	1.05
do below 32	.75	do 32 to 34.9	1.00
Homer, 35 and above	1 25	De Soto	1.25
do 33 to 34.9	1.15	Crichton	.90
do 31 to 32.9	1.10	Bellevue	.75
do below 31	.75	Smackover, 26 and above	.75
Haynesville, 33 and above	1.10	25 to 25.9	.60
do below 33	1.00	24 to 24.9	.50
El Dorado, 35 and above	1.25	Below 24 Be	.40

GULF COASTAL FIELDS

	1923 Oct. 15	1922 High		1922 Low		1921 High		1921 Low	
Spindletop	$1 00	Jan 1	$1.25	Dec 30	$1.25	Jan 1	$2.50	June 13	$ .80
Goose Creek	1 00	Jan 1	1.25	Dec 30	1 25	Jan 1	2.50	June 13	.80
Goose Creek "B"	1 00	Jan 1	1.25	Dec 30	1 25	Jan 1	2.50	June 13	.70
Sour Lake	1 00	Jan 1	1.25	Dec 30	1 25	Jan 1	2 50	June 13	.80
Humble	1 00	Jan 1	1.25	Dec 30	1 25	Jan 1	2 50	June 13	.80
Batson	1 00	Jan 1	1.25	Dec 30	1 25	Jan 1	2.50	June 13	.80
Hull "A"	1 00	Jan 1	1 25	Dec 30	1.25	Jan 1	2.50	June 13	.80
Hull "B"	1 00	Jan 1	1 25	Dec 30	1 25	Jan 1	2 50	June 13	.80
West Columbia	1 00	Jan 1	1 25	Dec 30	1 25	Jan 1	2.50	June 13	.80
Edgerly	1 00	Jan 1	1 25	Dec 30	1.25	Jan 1	2.50	June 13	.80
Vinton	1 00	Jan 1	1 25	Dec 30	1.25	Jan 1	2 50	June 13	.80
Jennings	1 00	Jan 1	1.25	Dec 30	1 25	Jan 1	2 50	June 13	.80
Dayton	1 00	Jan 1	1 25	Dec 30	1 25	Jan 1	2.50	June 13	.80
Saratoga	1.00	Jan 1	1 25	Dec 30	1.25	Jan 1	2.50	June 13	.80

WYOMING FIELDS

Elk Basin	$1.35	Jan 1	$1.90	Aug 4	$1.20	Jan 1	$3.10	June 27	$1.00
Grass Creek	1 35	Jan 1	1.90	Aug 4	1 20	Jan 1	3.19	June 27	1.00
Big Muddy	.75	Jan 1	1 40	Aug. 4	.70	Jan. 1	2 75	June 27	.50
Salt Creek	.90	Jan. 1	1.40	Aug. 4	.70	Jan. 1	2.75	June 27	.50
Lance Creek	1.20	Jan. 1	1 90	Aug. 4	1.20	Jan. 1	3.05	June 27	.95
Rock Creek	.90	Jan 1	1 50	Aug. 4	80	Jan 1	2.85	June 27	.60
Osage	1.35	Jan 1	1.90	Aug. 4	1 20	Jan. 1	3.05	June 27	.95
Cat Creek Mont	1 35	Jan. 1	1.90	Aug 4	1.20	Jan. 1	3 10	June 27	1.00
Sunburst Mont	.70								

CALIFORNIA

14-19.9	$ .60	25-25.9	.66	30-30 9	$ 71
10-20.9	.61	26-26.9	67	31-31 9	72
21-21.9	.62	27-27 9	68	32-32 9	73
22-22.9	.63	28-28.9	69	33-33.9	74
23-23.9	.64	29-29.9	70	34-34.9	.75
24-24.9	.65			35 and above	.76

"Doc" Cook On Trial For Selling Fake Stock

By Special Correspondent

FORT WORTH, TEX., Oct. 16.—Climax of the campaign by the U. S. department of justice and the postoffice department against the oil promotion ring which was flourishing in Fort Worth a year ago was reached in federal district court this week. That climax is the trial of Dr. Frederick A. Cook.

The one-time Arctic explorer and 22 of his associates, including the nationally known S. E. J. Cox, faced Federal District Judge John M. Killits of Toledo, O., in the local court on the charge of use of the mails to defraud. Estimates of the time which will be required to present all the evidence aganst Cook, and to hear the testimony of the defense, vary from a month to six weeks.

Three prosecutors are participating in the case, these being Sylvester R. Rush of Chicago and John S. Pratt of Toledo, special assistants to the United States attorney general, and Federal District Attorney Henry Zweifel of Fort Worth. Cook's chief counsel is Joseph Weldon Bailey of Dallas, formerly United States senator from Texas.

Cook, his fellow defendants, and the jury will listen during the progress of the case to a smashing attack on the methods used to sell nearly a half million dollars worth of stock in the Petroleum Producers Association, big "merger" bubble which Cook began blowing early in 1922. It burst when the 23 men were indicted last April.

The case will break all federal court records for mail fraud trials, the U. S. authorities assigned to it say. Witnesses summoned by the prosecution number more than 250. Letters, circulars, and other specimens of Cook's stock-selling literature which will be offered as "exhibits" will number thousands.

Should Cook be convicted, it is conceded he will be the last of the indicted Fort Worth promoters to plead not guilty. His is a sort of "last ditch" fight, in which every promoter who is under arrest or expects to be placed under arrest is deeply interested.

In addition to entering a general denial of the government's charge that his intentions in promoting the Petroleum Producers Association were fraudulent, Cook is expected to advance the counter charge that he is the victim of a "frameup" by big oil interests of the north and east.

Facing the possibility of long sentence in Leavenworth penitentiary in the event he is found guilty, Cook is at the crux of a most picturesque career. Long years ago he was a practicing physician in Brooklyn. He is said to have spent his leisure time there conducting religious services.

He became interested in exploration, and was attached to one or two Arctic expeditions as a doctor. About 1906 he made a sensational claim that he had succeeded in ascending to the summit of Mt. McKinley—the first white man to accomplish this feat. A guide, Edward Barrille, named by Cook as having accompanied him, later denounced this claim as false.

In September, 1909, Cook sailed into the harbor of Copenhagen, Denmark, and announced he had discovered the

North Pole. This was later denounced as an imposition.

Cook for several years dropped out of sight. Then he appeared in Wyoming, in an oil promotion role. From Wyoming he came to Fort Worth about four years ago.

In Fort Worth he first promoted three "Texas Eagle" companies, with capitalizations fixed at a total of $7,800,000. These collapsed, and last year Cook evolved the "merger" idea to which the Petroleum Producers Association gave expression.

When an end was put to his operations by his indictment and by a fraud order issued against him by the post-office department, Cook had issued about two and a quarter million dollars' worth of stock in his new enterprises, and had taken in nearly half a million dollars cash.

Government evidence against him will reveal exhaustively the "inner workings" of the "merger" game. Investigators will tell how stock exchange offers were made by Cook to persons who had lost money previously in nearly 300 syndicates, under representation that these syndicates had been absorbed by the Petroleum Producers Association.

What dealings Cook had with the "trustees" of several of these syndicates will be an important issue in the testimony. Several such "trustees" are among the defendants. Fraud in the transferring of their stockholder or "sucker" lists to Cook is charged.

Presence of S. E. J. Cox as a co-defendant lends additional interest to the trial. Cox, known far and wide as a sensational plunger in the promotion game, was associated with Cook for a time as a writer of stock-selling publicity. It was Cox who engineered the huge General Oil Co. promotions at Houston several years ago.

Federal Judge Killits of Toledo was assigned to Fort Worth to preside over the Cook trial because Judge James C. Wilson of this district was otherwise occupied.

Following Cook, promoters of the Revere Oil Co., Pilgrim Oil Co., and several other spectacular promotions are to be called to account.

Visit Barnsdall Plant

TULSA, Oct. 13.—Refiners attending the Tulsa exposition were guests of the M. W. Kellogg Co. and the Barnsdall Refining Co., Wednesday on a tour of inspection of the installation of eight Fleming pressure stills at the Barnsdall plant. The refiners were taken on a special train by P. Gerhard, Kellogg's Mid-Continent representative, and E. B. Gray, J. Coffey and F. Holsten, representing Barnsdall.

Those who made the trip follow: R. P. Ingram, Chesnut & Smith Corp.; I. E. Eells, Panhandle Refining Co., Panhandle, Texas; C. F. Sloan, Oklahoma City; M. V. McNally, Garfield Oil & Refining Co.; Dr. C. F. Comstock, Pure Oil Co.; R. R. Dean, V. R. Oakley and I. Green, of the Waite Phillips Co.; J. Hanson, Inland Refining Co.; J. T. Granger, Producers & Refiners Corp.; H. O. Parker, Brooklyn, N. Y.; Clay Briggs, Empire Refineries, Inc.; G. E. Bodine, C. L. Johnson and G. Barringer, Sapulpa Refining Co., and H. T. Bennett, Cosden & Co.

K&W Superlubricous

100@100° to 1250@100°

LUBRICATING OILS

Pale and Red Colors

HIGHLY FINISHED-STRAIGHT RUN

ZERO COLD TEST

INQUIRIES SOLICITED

KEEN & WOOLF OIL COMPANY

REFINERS

HOUSTON, TEXAS

Wheeling Cans

For Oils and Greases

Five Gallon Square Cans

Plain or Lithographed

WHITAKER-GLESSNER COMPANY

Can Department — Wheeling, W. Va.

OIL STOCKS and FINANCES

Union Of California's Profits Fall Off

LOS ANGELES, Oct. 11.—Union Oil Co. of California reports net income for the first nine months of 1923 the same as the corresponding period of 1922, but net profit after depreciation, depletion and cost of new drilling is more than $2,000,000 less. The company's statement gives these approximate earnings for the two periods:

Net income	17,000,000.00	17,000,000.00
Deprec., Depl.	4,650,000.00	3,950,000.00
Labor, New Drilling	5,150,000.00	3,800,000.00
Net profit	7,200,000.00	9,250,000.00

The sum of $1,789,000.00, representing inventory losses on the quantity of refining crude and tops on hand, resulting from the decline in prices during the nine months, has been charged direct to surplus. The excess cost over the present market price of purchases of oil during the current year has been charged against the nine months' profits. Net profits were also affected by the large increase in write-off for labor and incidental expenditures on new drilling and by increased depreciation charges.

Production of crude oil by Union and controlled companies approximated 13,300,000 barrels; an increase over the same period last year of 4,025,000 barrels. Present daily production in California is approximately 68,000 barrels, excluding 10,000 barrels a day shut in. In August the company brought in its Callender No. 1 well in the Compton Field, which is now producing 1,400 barrels a day and which opens up a substantial additional area of territory.

Sales for the nine months approximate $55,100,000, an increase in value of $11,000,000, or about 25 per cent, the company reports. "The volume of crude and fuel oil business increased 154 per cent and refined and lubricating business 22 per cent.

"Capital expenditures approximate $16,500,000, consisting of the cost of developing 149 wells drilled and in proces of drilling and new concrete and steel storage having an aggregate capacity of 10,000,000 barrels. During the nine months we also purchased two new tankers, having a carrying capacity of 120,000 barrels, from the shipping board, and have made substantial expenditures for the extension of our marketing facilities."

Current assets amounted to $44,000,000, about $1,000,000 less than at Dec. 31, 1922. Current assets are over 5 to 1 of current liabilities.

Current liabilities approximate $8,000,000, a decrease of $2,000,000 from Dec. 31. During the nine months there been an increase in bonded debt 5,797,000. Purchase money obligations increased $960,000, on account of purchase of new tankers, tank cars and additions to oil lands. The increase in bonded debt is occasioned by the issuance of $7,500,000 serial gold bonds, series B, which mature in equal installments April 1, 1924, 1925 and 1926.

Middle State's Net Lower This Year

NEW YORK, Oct. 12.—Net income of $2,885,553 is reported by Middle States Oil Corporation for the first half of 1923 after expenses, rentals and reserves for Federal taxes, but before depletion, as against $3,586,798 in the corresponding period of 1922. Earnings this year were equivalent to 96 cents a share as against $1.45 a share last year. Comparative income accounts for the two half-year periods follow:

	1923	1922
Gross income	$ 4,897,282	$ 5,809,774
Exp. rtls, new cnst., etc.	1,936,729	2,222,976
Balance	$ 2,960,553	$ 3,586,798
Res for fed taxes	75,000	100,000
Net income	$ 2,885,553	$ 3,486,798
Dividends	2,185,732	1,319,731
*Surplus	$ 699,821	$ 2,167,067

*Subject to depletion.

Consolidated balance sheets as of June 30, 1923, and December 31, 1922, follow:

ASSETS

	1923	1922
Capital assets, invst.	$93,325,569	$92,801,078
Cash	206,061	242,426
Acc'ts rec.	1,733,410	1,751,000
Bills rec.	197,002	.....
Material, etc.	600,000	404,655
Total	$96,062,042	$95,199,159

LIABILITIES

Capital stock	$29,783,770	$23,917,000
Acc'ts payable	41,000	60,000
Reserves	75,000	150,000
Surplus	66,162,272	71,072,159
Total	$96,062,042	$95,199,159

Proration Cuts Profits

NEW YORK, Oct. 12.—Panhandle Producing & Refining Co. in a letter to stockholders explaining why the preferred stock dividend was passed recently, states its income from crude oil production recently has been greatly reduced because purchasing companies are paying for only 50 per cent of the crude run and storing the remainder for the company's account.

"The price of gasoline is so low that it is impossible to refine oil at a profit at the present price of crude," the letter continues. "Recent cut in the posted price of crude oil has had the effect of reducing the loss, but it is not low enough yet to make refining profitable."

Since June 30, the company has paid off trade acceptances payable amounting to $85,262 and reduced bank loans $75,000 to $415,000. It also has installed and paid $150,000 for the Dubbs cracking process.

Shell-Union Offers More Common

NEW YORK, Oct. 11.—Directors of the Shell-Union Oil Corporation have decided to issue the remaining 2,000,000 shares of common stock authorized. Rights have been given holders of record October 22 to subscribe to one share for each four shares held. Price will be $10 a share. The entire issue has been underwritten.

The offer is made, the corporation announces, for the purpose of meeting requirements of the company's greatly increased business and the offering is made below the intrinsic and market value of the stock in order to permit stockholders to share in the increased earnings and at the same time to enable the company to retain in the business the increased earnings. Rights to subscribe expire November 22.

Eight million shares of common are outstanding. At the time of organization the Royal Dutch-Shell group owned 5,760,000 shares of 72 per cent.

Subscription rights and the additional shares have been listed on the New York Curb Market, when, as and if issued.

Indiahoma Shows Deficit For Half Year

ST. LOUIS, Oct. 12.—Indiahoma Refining Co. for first half of 1923 reports a deficit of 1.010, 591 as against net income of $441,788 in first half of 1922. Income accounts for the two six-month periods compare:

	1923	1922
Operating loss	$468,659	*$756,154
Interest, etc.	541,932	314,366
Deficit	$1,010,591	*$441,788

*Operating or net profit.

Consolidated balance sheets as of June 30, 1923, and Dec. 31, 1922, compare:

ASSETS

	1923	1922
Cash	$112,119	$281,894
Notes, acc'ts rec.	399,698	1,270,658
Inventories	698,503	1,646,027
Prepaid charges	41,063	56,959
Sinking fund	3,072	2,961
Due from employes on stock purchase	204,536	217,986
Investments	87,000	111,750
Leaseholds*	4,052,104	3,912,835
Property*	3,766,400	3,564,828
Unamortized discounts	345,809	389,064
Total	$9,717,304	$11,454,966

LIABILITIES

Notes, acc'ts pay.	$893,060	$1,362,721
Sinking fund	202	1,717
Accrued int., taxes	121,638	130,548
Scrip payable	.....	6,983
Contingencies	85,000	85,000
Car trust notes	267,828	360,829
8% Bonds	1,558,000	1,631,000
8% notes	708,000	782,000
Capital stock	5,000,000	5,000,000
Surplus	1,083,576	2,094,168
Total	$9,717,304	$11,454,966

Transactions In Oil Shares On New York Stock Exchange

1922 High	1922 Low	1923 High	1923 Low	Listed Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions week ended Oct. 11 Sales	First	High	Low	Last &	Ch'ge
135½	91	134	98¼	$40,000,000	$100	Associated Oil	1½Q	July 25, 23	600	108	108	107	107	—1
.....	.....	27	25	40,000,000	25	do new	.....	.....	5,600	27⅛	27⅜	26½	26⅝	—⅛
1575	117	160	98¾	50,000,000	100	Atlantic Refining	$1Q	Sept. 15, 23	6,500	½	½	⅜	½	.....
119½	114	120	115	20,000,000	100	do pfd	1¾Q	Aug. 1, 23	100	103	103	103	103	—4
56¼	19¾	35	9⅞	13,000,000	25	Barnsdall Corp. A	.62½	Apr. 30, 21	100	117	117	117	117	0
39	17	22	6⅜	3,713,275	25	do B	.62½	Apr. 30, 21	700	12	12	10½	10½	—2½
15¼	6¾	9¼	1⅛	150,000	N.P.	Caddo Central O. & R	.....	.....	200	7	7	7	7	—1
71⅞	43⅛	29¾	17⅛	17,377,000	25	California Petroleum	43¾Q	Sept. 1, 23	300	2	2	1¾	1¾	—⅛
98½	83	110½	90½	12,989,500	100	do pfd	1¾Q	Oct. 1, 23	22,300	20⅛	20⅛	18⅛	18⅜	—1⅜
54	31¾	62⅝	22¾	1,217,427	N.P.	Cosden & Co	$1Q	Aug. 1, 23	300	93	93	93	93	0
102½	93½	109⅜	85	6,998,000	100	do pfd	1¾Q	Sept. 1, 23	43,500	26⅞	27	24¾	25¼	—1¾
78¾	37½	54	23	19,830,000	100	General Asphalt Co	.....	.....	100	89¾	89¾	89¾	89¾	—1
111	68½	83	60	7,416,100	100	do pfd	1½Q	Sept. 1, 23	2,900	30	30	27½	27½	—2⅝
78	45	50¼	40	3,236,600	100	Gilliland Oil Pfd	2	May 15, 21	500	63	63	62	62	—1
91¾	61¼	78	40¾	25,000,000	100	Houston Oil Co	.....	.....	2,300	52¾	52¾	47⅝	48⅛	—3⅞
.....	.....	11¼	3⅜	450,000	N.P.	Independent Oil & Gas	.....	.....	2,100	5¼	5⅜	5⅛	5¼	0
25	12	19	1¼	5,000,000	25	Indiahoma Refining	‡.15	July 1, 21	5,500	2¼	2¼	1⅜	1⅜	— ⅜
11⅝	5¾	8½	2½	7,830,450	10	Indian Refining	.50	Dec. 15, 20	100	5	5	5	5	+2½
20¾	12½	19¼	8	671,280	N.P.	Invincible Oil	.....	.....	2,500	9	9⅛	8⅝	8⅝	—½
3	¼	⅝	⅛	25,709,510	10	Island Oil & Trans	.....	.....	22,600	⅛	¼	⅛	⅛	—⅛
7½	1½	3½	¼	14,662,890	10	Kansas & Gulf	.....	.....	300	¼	⅜	¼	¼	0
.....	.....	22½	16	250,000	N.P.	Maracaibo Oil	.....	.....	2,900	18⅛	20	18⅛	18½	+¼
46¾	22¾	59¾	20¼	1,017,969	N.P.	Marland Oil Co	$1Q	July 1, 23	21,900	25⅜	26	23¼	23¾	—2⅜
822	106¾	293	182	46,942,800	100	Mexican Petroleum	4Q	Oct. 20, 23	.....	.....	.....	.....	.....	.....
108	79¼	105½	100¼	12,000,000	100	do pfd	2Q	Oct. 20, 23	.....	.....	.....	.....	.....	.....
34½	14½	23¾	5¾	444,604	N.P.	Mexican Seaboard	.50Q	June 1, 23	3,600	10½	10⅝	9	9	—1⅜
32⅜	12	23¼	6	261,000	N.P.	do V. T. C	.50Q	June 1, 23	2,000	10	10	9½	9½	—½
16	11	12¼	4¾	29,791,450	10	Middle States Oil	.30Q	July 1, 23	18,600	5½	5½	5	5¼	—¼
62	47	67	31	39,626,000	25	Ohio Fuel Supply	.56¼	Oct. 15, 23	300	31	31⅜	31	31⅜	+⅛
4¾	1¾	3⅛	1¼	5,359,425	5	Oklahoma P. & R	2	Apr. 1, 21	200	1⅜	1⅜	1¼	1¼	—⅛
69⅜	42½	48⅞	31¼	3,500,000	N.P.	Pacific Oil Co	$1SA	July 20, 23	42,900	39½	39⅝	36½	37¾	—1⅝
100⅞	48⅞	93½	53	48,292,450	50	Pan-American P. & T	$2Q	Oct. 20, 23	18,600	58	58	55¾	56⅞	—1¾
95¾	44	86	50⅜	81,047,200	50	do B	$2Q	Oct. 20, 23	32,500	55	55⅞	53½	54¼	—1½
12	3	6¼	1¾	198,770	N.P.	Panhandle P. & R	.....	.....	.....	.....	.....	.....	.....	.....
78	61	68	51	2,935,200	100	do pfd	2Q	July 2, 23	.....	.....	.....	.....	.....	.....
59¼	28¼	69⅝	19¾	1,183,282	N.P.	Phillips Petroleum	.50Q	Oct. 1, 23	21,900	25⅛	25⅞	23¼	23⅝	—1½
12	4	6	1½	29,622,925	25	Pierce Oil Corp	.....	.....	600	2	2	1¾	1¾	—⅛
71	32	44½	18	15,000,000	100	do pfd	2	Feb. 1, 22	1,000	17½	17½	16	17	—1
51	24½	58⅛	20⅛	37,450,850	50	Producers & Refiners	50Q	Sept. 15, 23	61,200	23	25¼	20¾	20½	—2½
49	36	49⅛	36	2,845,350	50	do pfd	87½Q	Aug. 6, 23	200	38	38	38	38	—1
38⅝	26½	32	16⅛	69,985,325	25	Pure Oil Co	37½Q	Sept. 1, 23	9,300	17¾	17½	17⅛	17¼	+⅛
102¾	94	100	82½	13,000,000	100	do 8% pfd	2Q	Oct. 1, 23	100	86	86	86	86	0
67	47¼	55⅛	40½	(sh) 690,854	13.40	Royal Dutch, N. Y. shares	2.15	Aug. 10	4,400	43½	44¼	43⅛	44⅜	+⅛
48½	34⅝	41¼	29⅛	(sh) 159,854	£1	Shell Transport	1.13½	July 26, 23	.....	.....	.....	.....	.....	.....
13¼	12⅛	19¼	12⅜	8,000,000	N.P.	Shell Union	.25Q	Sept. 29, 23	80,500	15⅞	15⅞	13⅛	13⅞	—1⅞
96⅛	90	95	90	20,000,000	100	do pfd	1¾Q	Aug. 15, 23	500	91	92	91	91½	—½
.....	.....	16	6½	6,469,100	10	Simms Pet	.....	.....	2,200	7⅝	7⅝	7⅛	7½	—½
38¾	18¾	39⅜	16	4,479,565	N.P.	Sinclair Consolidated	.50Q	Aug. 31, 23	69,600	19	19⅛	17⅜	19	+⅛
102	97⅜	99⅛	80½	19,640,000	100	do pfd	2Q	Aug. 15, 23	500	83⅛	84½	83⅛	84½	+1
11⅞	8¾	35	12⅛	20,576,690	25	Skelly Oil	.....	.....	4,900	16¾	17⅛	16¼	16¾	—⅛
135	91¾	64⅛	47⅓	231,867,100	25	S. O. California	.50Q	Sept. 15, 23	18,800	53¾	53½	50¼	51	—2½
250½	169	44¼	30⅜	500,992,200	25	S. O. New Jersey	.25Q	Sept. 15, 23	18,100	34⅛	34⅜	32⅜	32½	—1½
120	113¾	118¼	114¾	199,972,900	100	do pfd	1¾Q	Sept. 15, 23	300	116¾	117	116¾	116¾	—⅛
10¼	4	6¾	2	451,708	N.P.	Superior Oil	.50	Dec. 20, 20	300	2½	2½	2¼	2¼	—¼
52¼	42	52⅞	39¼	164,450,000	25	The Texas Co	.75Q	Sept. 29, 23	13,700	41⅝	41⅞	40	40½	—1
32¾	18½	24¾	7	8,380,340	10	Tex. Pac. Coal & Oil	.25Q	June 30, 23	1,900	7½	7⅞	7½	7½	—⅜
154	109¾	144	94	49,688,400	100	Tide Water Oil Co	2	Dec. 30, 21	400	103¾	103⅞	101	101	—2
20½	7½	14½	2	2,000,000	N.P.	Transcontinental Oil	.....	.....	37,000	3⅛	3⅛	† 2	2⅜	—¾
134¾	85⅞	99¾	81	18,000,000	100	Union Tank Car Co	1¼Q	Sept. 1, 23	100	87	87	87	87	—1
118	102	114	106	12,000,000	100	do pfd	1¾Q	Sept. 1, 23	100	107¼	107¼	107¼	107¼	—¼
34	25	30⅜	20⅛	460,000	N.P.	White Eagle Oil & Ref	.50Q	Oct. 20, 23	700	23	23	22¼	22¼	—½
11⅜	2⅛	5⅞	⅜	959,046	N.P.	White Oil Corp	.....	.....	8,100	½	½	⅜	⅜	— ⅛

*New High †New Low ‡In Scrip xEx—Dividend Total Sales 619,000

Standard Oil Stock Traded In New York Curb Market

1922 High	1922 Low	1923 High	1923 Low	Outstanding Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions Week Ended Oct. 11 Sales	First	High	Low	Last	Ch'ge
25	16⅜	19¾	13½	£3,000,000	£1	Anglo-American Oil	46½S.A.	May 15, 23	1,000	14½	14⅝	14	14	—½
12½	4⅞	7⅜	2½	(sh)500,000	N.P.	Atlantic Lobos	.....	.....	500	3	3	2¾	2¾	—¼
610	335	150	113	$ 1,000,000	100	Borne-Scrymser	4S.A.	April 16, 23	.....	.....	.....	.....	.....	.....
110	83	94½	77	10,000,000	50	Buckeye Pipe Line	$1.75 Q	Sept. 15, 23	410	80	80	77	77	—2¾
225	175	237	207	1,500,000	100	Chesebrough Mfg	3½ Q	Sept. 29, 23	.....	.....	.....	.....	.....	.....
113	104	.....	.....	1,000,000	100	do pfd	1¾Q	Sept. 29, 23	.....	.....	.....	.....	.....	.....
153	125	50	32½	10,000,000	25	Continental Oil	50 Q	Sept. 15, 23	.....	.....	.....	.....	.....	.....
49	28	47½	15¾	1,500,000	25	Crescent Pipe Line	37½ Q	Sept. 15, 23	100	16¼	16¼	16¼	16¼	—¾
185	115	168	85	3,000,000	100	Cumberland Pipe Line	12A	Dec. 15, 23	60	106	106	104	104	—2
103½	79½	117	95	5,000,000	100	Eureka Pipe Line	3Q	Aug. 1, 23	50	98	98	x97¼	97¼	—¾
62	40	78	55	16,000,000	100	Galena Signal Oil	1Q	Sept. 29, 23	25	61	61	60½	60½	—½
105	100	105	104	4,000,000	100	do new pfd	2Q	Sept. 29, 23	.....	.....	.....	.....	.....	.....
114	104	.....	.....	2,000,000	100	do old pfd	2Q	Sept. 29, 23	.....	.....	.....	.....	.....	.....
267	212½	41¼	28	43,750,000	25	Humble Oil & Ref	80Q	Oct. 1, 23	400	31	32	31	32	+1⅛
198	154	171	152	20,000,000	25	Illinois Pipe Line	8 S.A.	June 30, 23	50	156	157	156	157	+1
150¾	97½	123	92	39,222,750	25	Imperial Oil, coupons	75 Q	Sept. 1, 23	435	99½	99½	98	98	—1½
111	84	103	83¾	5,000,000	50	Indiana Pipe Line	$2 Q	Aug. 15, 23	350	90	90½	89	90½	+½
27½	14	24⅞	13¼	(sh)7,188,138	N.P.	International Petroleum	25c	June 30, 23	6,900	15⅞	15⅞	15¼	15¼	—⅝
259	150	168	123	180,000,000	100	Magnolia Petroleum	1Q	Oct. 5, 23	520	135½	141	135	135	0
31⅛	23	29	22½	6,362,500	12½	National Transit	50Q	Sept. 15, 23	100	23	23	23	23	—¼
214	117	137	92	5,000,000	100	New York Transit	2Q	Oct. 15, 23	20	95	95	95	95	0
127	90	110	96	4,000,000	100	Northern Pipe Line	5 S.A.	July 1, 23	.....	.....	.....	.....	.....	.....
365	71	85½	48¾	60,000,000	25	Ohio Oil Co	3Q	Sept. 29, 23	1,800	55½	56½	55½	55½	—⅞
44⅞	16	28¾	10½	10,000,000	25	Penn-Mex Fuel	.....	.....	700	28	*28¾	19	20½	—7
750	520	700	152	54,000,000	100	Prairie Oil & Gas	2Q	July 31, 23	1,555	170	171	164	166	—4½
325	224	335	93	81,000,000	100	Prairie Pipe Line	2Q	July 31, 23	1,125	99	99½	98¼	99	0
405	340	212½	161	4,000,000	100	Solar Refining Co	5 S.A.	June 20, 23	.....	.....	.....	.....	.....	.....
110	77	116	92	10,000,000	100	Southern Pipe Line	$2Q	Sept. 1, 23	190	93¾	93¾	†92 92	92	—2
249	150	195	100	20,000,000	100	South Penn Oil	1½Q	Sept. 30, 22	130	125	126	119	119	—3
70½	50½	88¼	66⅜	3,500,000	100	Southwest Pa. Pipe Lines	2Q	Oct. 1, 23	.....	.....	.....	.....	.....	.....
135	58⅜	69⅜	49¾	220,181,638	25	S. O. Indiana	62½Q	Sept. 15, 23	81,000	56¼	56½	53⅞	54¼	—2⅛
690	41	57	36½	8,000,000	25	S. O. Kansas	50Q	Sept. 15, 23	200	40	40	39	39	—1¾
131	76½	139	88	17,500,000	25	S. O. Kentucky	$1Q	Oct. 1, 23	1,000	92	92½	91	91½	—1½
217	170	285	186	3,000,000	100	S. O. Nebraska	5 S. A.	Dec. 15, 22	10	220	220	220	220	0
675	41⅛	49⅝	35⅛	225,000,000	25	S. O. New York	35Q	Sept. 15, 23	9,300	43	43½	40¾	41½	—1⅜
585	261	317	270	14,000,000	100	S. O. Ohio	2½Q	Oct. 1, 23	35	280	280	275	275	—3
119½	113½	118	116	7,000,000	100	do pfd	1¾Q	Sept. 1, 23	.....	.....	.....	.....	.....	.....
37	30	39	21	1,806,200	100	Swan & Finch	2½S.A.	Nov. 1, 19	.....	.....	.....	.....	.....	.....
710	36¼	55¼	40	60,000,000	25	Vacuum Oil Co	50Q	Sept. 20, 23	23,300	49¾	50½	49⅛	49⅜	+¼
32	20	28	19	100,000	10	Washington Oil Co	20A	Jan. 31, 22	40	19	19	†19	19	—3

White Oil Earns Profit

NEW YORK, Oct. 13.—White Oil Corporation for eight months of this year reports net income of $20,910 after expenses, taxes, interest, depreciation and depletion. The consolidated income account for the period follows:

Gross revenue	$2,539,478
Expenses, taxes, etc	2,061,412
Interest	125,558
Depreciation and depletion	331,598
Net income	20,910

The New York Stock Exchange has listed Chase National Bank certificates for 951,289 shares of White common stock under the reorganization plan.

Oil Dividends

	Amount	Payable	Stock of Record
Derby Oil pfd. q	$1	Oct. 20	Oct. 17
Sinclair Cons. q	50c	Nov. 30	Nov. 1
do pfd	$2	Nov. 15	Nov. 1
Shell-Union pfd. q	$1.50	Nov. 15	Nov. 1
Union of Cal. q	$1.80	Oct. 27	Oct. 10
Union Tank Car q	$1.25	Dec. 1	Nov. 5
do pfd. q	$1.75	Dec. 1	Nov. 5
Amalgamated Oil q	75c	Oct.15	Sept.28
Atlantic Ref. pfd. q	$1.75	Nov. 1	Oct.15
Beacon Oil q	$1.87½	Nov.15	Nov. 1
Eureka Pipe q	$2	Nov. 1	Oct.15
Indiana Pipe q	$2	Nov.15	Oct.19
New England Fuel q. 5%		Oct. 1	Sept.27
White Eagle q	50c	Oct.20	Sept.29

Cleveland Stock Market

	Par Value	Oct. 11 Bid	Asked	1922 High	Low
National Refg	$5	35	38	55	31¾
do pfd	100	124	130	128	118
Paragon Refg	$5	6¼	6½	16¼	10¼
do pfd	100	59	68	80	75
Fred G. Clark Co	10	2	.....	11	6

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Specify P & C Valves

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Pratt & Cady Division

Bridgeport, Conn.

Stocked by Norvell-Wilder Hardware Co. Beaumont, Houston, Mildred and Shreveport

Grinnell Co., of the Pacific, Los Angeles, Cal.

An Associate Company of the American Chain Company Incorporated

NEW YORK BONDS

Week Ended Oct. 13

	High	Low	Last	Ch'ge
Atlantic Ref. deb 5s	97½	96½	96½	—7/8
Barnsdall 8s	96	95	95¼	—¼
Empire G. & F. 7½s	92½	92	92½	—¼
Humble O. & R. 5½s	97⅜	96½	96⅝	0
Marland Oil 8s ser. A	102	99¾	100½	—½
Mex Pet of Del cvt 8s	104	104	104	+1
Pan-Am Pet & T 7s	103	103	103	0
Prod. & Ref. 8s	102½	101¾	101¾	+⅝
do with war	109⅝	109	109⅝	+⅝
Sinclair Cons cvt 7s	94	93¼	93½	0
do 6½s	88½	87	88⅜	+1½
Sinclair Crude 6s Ser B	96⅛	95½	96	+⅛
Sinclair P L s f 5s	82¾	82	82⅛	+¾
Tidewater 6½s	102½	102¼	102¼	—¾
Union of Cal. 6s	100	99½	99½	—½
Union Tk Car 7s	103½	103¼	103¾	+¾

NEW YORK CURB BONDS

Week Ended Oct. 11

	High	Low	Last	Ch'ge
Anglo-Am	102½	102	102¼	+¼
Cities Serv 7s				
Cities Serv 7sC reg	89	88½	88⅝	—⅜
Cities Serv 7s D	88⅜	88⅛	88⅜	—⅜
Galena S O 7s	103¼	103¼	103¼	0
Gen Asphalt 8s	101¾	101¾	101¾	+¼
Gen Pet 6s	94	94	94	0
Gulf Oil 5s	94¾	94½	94½	0
S O N Y 7s '25	103⅛	102½	102½	—½
do 7s '26	103½	103	103½	—¾
do 7s '27	104½	104¼	104¼	—¼
do 7s '28	104¾	104½	104½	—½
do 7s '29	106½	106	106½	—½
do 7s '30	106	105½	106	—1
do 7s '31	107¾	106¾	107⅛	—⅛
do 6½s	106⅞	106⅛	106⅛	0
Sun Oil 7s	101⅜	101½	101⅜	0
do 6s	97⅝	97⅝	97⅝	—⅛
Tidal Osage 7s	101½	100¾	100¾	—¼
Union Oil Cal. 8s '26	99⅛	99	99	0
Union Oil Prod 8s	80	79½	80	—2
Vacuum Oil 7s	106⅛	105¾	106⅛	+⅜

NEW YORK CURB MARKET

1922 High	1922 Low	1923 High	1923 Low	Par Value	Stocks	Transactions Week Ended Oct. 11 Sales	First	High	Low	Last	Ch'ge
13	6¾	10	4¾	10	Ark. Nat. Gas	6,800	4⅞	5⅞	†4¾	5⅝	+⅝
9¾	3¼	7⅜	3⅛	25c	Carib. Synd. ctf	1,500	3⅛	3⅝	3⅛	3⅛	—⅜
242	158	198	128½	100	Cities Service	440	131	131	†128½	129½	—1½
72	51	70	64	100	do pfd	2,300	66¾	67¾	66¾	67¾	+¾
25½	16¾	19½	12¾	10	do bankers sh	1,700	13	13	12¾	13	0
5	1¼	7⅞	1½	N. P.	Creole Syndicate	7,800	2⅛	2⅛	1⅝	1⅞	—¼
		18¾	5¾	N. P.	Derby O. & R						
2¼	.65	1	.35	5	Federal Oil						
19½	8⅞	19¼	16⅛	N. P.	Fensland Oil						
		38	24	25	General Petroleum	300	32	32	31½	31½	—⅜
9⅝	2⅝	7⅜	3	N. P.	Gilliland Oil						
7¾	78	2¼	.50	10	Glenrock Oil	1,500	.69	.70	.68	.70	0
71½	48½	68¼	45¾	25	Gulf Oil Corp	1,300	51¼	51½	51	51	—1
26½	2¼	4	1	N. P.	Kirby Petroleum	100	2⅜	2⅜	2⅜	2⅜	0
49¼	39⅜	58	45	N. P.	Mammoth A						
10	1	5	1½	N. P.	Marland of Mexico	1,100	3½	3½	3¼	3¼	—¼
18	9⅞	20¼	12⅞	10	Mountain Prod	2,100	14¾	14¾	14	14¼	—½
13⅜	5¾	15½	8¼	5	Mutual Oil Co	5,900	9¼	9¼	8⅞	8⅞	—⅛
		5¾	3½	5	New Bradford	800	4⅝	4⅝	4⅜	4½	—⅛
83	40	52	16	10	New Eng. Fuel Oil						
3	.67	1 11/16	.50	10	Omar O. & G	5,400	.60	.60	.55	.60	0
		13	.76	N. P.	Peer Oil Corp	400	.86	.86	.85	.85	—.02
9¾	4⅞	14¾	9⅛	10	Pennok Oil	1,500	11½	11½	11⅛	11½	—⅛
14¾	10	15⅛	6¾	10	Salt Creek Cons						
22	12⅛	25¼	15½	10	Salt Creek Prod	2,000	18⅞	19⅛	18¾	18¾	—⅛
5	2⅝	4⅞	1	5	Sapulpa Refining	500	1⅝	1¾	1½	1¾	+⅛
3⅛	.80	4	.80	5	Seaboard O. & G	4,900	1⅛	1⅛	1	1⅛	0
21	12¼	26⅝	11⅝	N. P.	Southern States	37,700	15½	15½	14⅞	15	+⅝
34	23	30	19	5	Ventura Cons						
7⅞	2¼	10⅞	4	5	Wilcox O. & G	8,200	4⅜	4⅜	4⅛	4⅛	—¼

PITTSBURGH STOCK EXCHANGE

1922 High	1922 Low	1923 High	1923 Low	Par Value	Stocks	Transactions Week Ended Oct. 11 Sales	First	High	Low	Last	Ch'ge
12⅝	8¼	10	4¼	10	Arkansas Nat. Gas	8,400	5	5¾	†4¼	5⅜	+⅝
55½	21			25	Barnsdall Corp. A						
38½	20			25	do B						
112¾	64½	112½	83⅜	100	Columbia Gas						
49	42			N. P.	Cosden & Co						
2⅞	2⅛	2⅛	2⅛	10	Kansas & Gulf						
31⅛	40	27	22¾	25	Lone Star Gas	457	24¾	25½	24½	25½	+1
58⅞	45⅝	58	51	50	Manuf. Light	185	53	53½	53	53¼	+¼
45	23¾	59¼	30⅜	N. P.	Marland Oil						
15⅜	12⅜	12	11¼	N. P.	Middle States						
23	15⅛	19	11¼	1	Ohio Fuel Oil						
62	44½	65½	30⅛	25	Ohio Fuel Supply	415	32	32	31	31¾	+¼
26¾	19	22¾	18⅝	25	Okla. Nat. Gas	1,035	22	22¼	21¾	22	+½
4	2	2⅞	1⅞	5	Okla. Prod. & Ref						
		74½	74½	50	Pan-American B						
11	6	10½	6	5	Pittsburgh O. & G	30	6⅛	6⅛	6⅛	6⅛	0
65⅜	57½	53½	50	13.40	Royal Dutch						
14⅞	8¾	14	6⅞	10	Salt Creek Cons	2,035	7½	7½	7¼	7¼	—¼
37¾	8	35⅜	32	N. P.	Sinclair Cons						
47⅞	46½			25	The Texas Co						
14⅜	10	13½	7	N. P.	Tidal Osage	150	7½	7½	7½	7½	0
18⅜	9⅜	14	10¼	N. P.	Transcontinental						
25	24½	29½	23¾	25	Union Nat. Gas	150	28⅞	29	28	28	—½

PITTSBURGH CURB MARKET

1922 High	1922 Low	1923 High	1923 Low	Par Value	Stocks	Transactions Week Ended Oct. 11 Sales	First	High	Low	Last	Ch'ge
		15	15		Central Ky. Gas						
4⅞	1	1½	.80	10	Colombia Synd	500	.30	.30	.30	.30	
3	1⅞	2¾	.40	5	Duquesne Oil						
		37	10	10	Forest Oil						
		1¼	1	1	Grant Oil						
71	.50	68	46½	25	Gulf Oil Corp	500	51	51	51	51	—1⅛
.12	.02	.03	.02	1	Homer Union						
		24½	16½	N. P.	International Pet						
9	6½	8½	4	10	Marshall Oil	100	4	4	4	4	
.42	.18	.36	.21	1	Mexican Wyoming						
		35⅛	35⅛		New Bradford Oil						
1½	1	2⅜	1⅛		Oklahoma Eastern	2,500	2	2	1⅞	2	0
1¼	1	2	.78	10	Omar Oil & Gas						
52	29	22½	7	5	States Oil	100	7	7	†7	7	
		80	80	100	Southwest Pa. Pipe						
		23	23	25	Tropical Oil						
.09	.03	.05	.03	1	Twin City O. & G						

*New High †New Low xEx Dividend